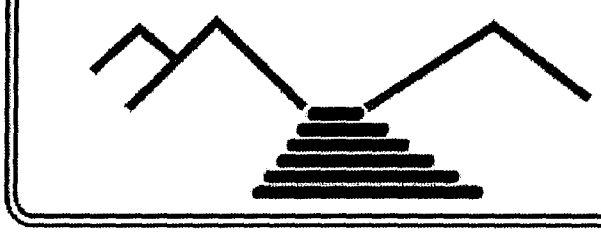
BGES, INC.

BRAUNSTEIN GEOLOGICAL & ENVIRONMENTAL SERVICES



FOURTH AVENUE AND GAMBELL STREET
(LOTS 8A, 10, 11, AND 12, BLOCK 26A, EAST ADDITION) ANCHORAGE, ALASKA

ADDITIONAL SITE ASSESSMENT

DECEMBER 2007

Submitted to: **Paul Maney**

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1.0 INTRODUCTION

BGES, Inc. (BGES) was retained by Mr. Paul Maney, the owner of the property located on 4th Avenue, between Gambell Street and Hyder Street, in Anchorage, Alaska, to conduct an Additional Site Assessment at the subject property. The work was requested by the Alaska Department of Environmental Conservation (ADEC) in their letter dated January 24, 2007. Specifically, the ADEC requested that the extent of soil and groundwater contamination be characterized, both on and off the site; shallow soil sampling be conducted to determine if there are any impacts to the soils from the ground surface to 15 feet below grade (bg); and groundwater samples be collected from all of the existing and newly-installed monitoring wells. The work plan to accomplish these tasks was submitted to the ADEC and was conditionally approved on April 26, 2007 (BGES, INC., 4TH and Gambell Work Plan For Additional Site Assessment, Anchorage, Alaska).

The ADEC contaminated sites database file number for this site is 2100.38.434, and the site is referred to as the Alaska Real Estate Parking Lot located at 717 East Fourth Avenue (Figure 1) in the ADEC database. The legal description of the property is Lots 8A, 10, 11, and 12 Block 26A, East Addition Subdivision, Municipality Parcel Numbers 00209308-000, 00209307-000, 00209350-000, and 00209351-000, respectively. The site is currently undeveloped and used as a parking lot for the Anchorage Job Center. An Alaska Communications System antenna tower is situated on the southeast portion of Lot 12, in the southeast corner of the property. Photographs of site activities are included in Appendix A.

2.0 BACKGROUND

The property was formerly occupied by a variety of businesses, including C&K Cleaners (which was likely a drycleaners) from approximately 1968 through 1970, and NC Tire Center, which was the last occupant of the last building on the site (eastern portion) prior to being demolished. A Phase I Environmental Site Assessment (ESA) was conducted at the subject property in 1993. The findings of the Phase I ESA indicated that underground storage tanks (USTs) were thought to exist at locations in the northeast corner of the property, where we did subsequently encounter USTs as described in our September 2004 Phase II ESA Report, and in the north-central portion of the property, where USTs were not encountered during our subsurface assessment.

A Phase II ESA was reportedly conducted in 1997, and the draft results were recently made

available to the current property owner, Paul Maney and to BGES. A subsequent review of this Limited Phase II ESA performed by Environmental Project Management Inc. (EPMI) titled "Initial Site Characterization and Subsurface Investigation Report", dated December 1997, indicates that areas of contaminated soil and water were identified at the subject property. The characterization, performed in August of 1997, revealed that the two main areas of interest were located in the western portion of the subject property, where the former dry cleaning building was located, and in the northeast area of the property, where the former NC Tire facility was located.

Three trenches in the western portion of the subject property unearthed four empty drums and a log crib. The drums were marked by the manufacturer for use in dry cleaning. One soil sample from the drum area (Sample S-5), collected from a depth of 7 feet below grade (bg), exhibited 3.2 parts per million (ppm) tetrachloroethylene (PCE), and one soil sample associated with the wood crib (Sample S-6), collected from a depth of 12 feet bg, exhibited 1.0 ppm PCE, both of which are above the ADEC cleanup criterion. The sample collected from the soils associated with the wood crib was also analyzed for Resource Conservation and Recovery Act (RCRA) metals, and exhibited a concentration of arsenic above the ADEC cleanup criterion.

The northeastern portion of the subject property was the location of a former NC Tire facility, which housed 7 hydraulic lifts and associated piping underneath a concrete slab. After the concrete slab was removed from the hydraulic lifts area, sumps were discovered that were connected by underground piping. Six samples (S-8, S-9, S-10, S-12, S-13, S-14) were collected from depths ranging from 7 feet bg to 11 feet bg, and analyzed for residual range organics (RRO). The analytical results exhibited concentrations of RRO below the ADEC cleanup criterion. The piping associated with the hydraulic lifts led to a log crib (an underground box made from wood), which was likely used as a septic system as well as a disposal system for rinse and wash water for the tire facility. Three soil samples (S-2, S-3, S-4) from the crib area were collected. Sample S-2, collected from a depth of 15 feet bg, exhibited concentrations of RRO less than the ADEC cleanup criterion. This sample also exhibited 16 ppm total petroleum hydrocarbons (TPH), and PCE at 2.2 ppm. Sample S-3, collected from the crib area at a depth of 19 feet bg, exhibited non-detectable concentrations of VOCs above the method reporting limit (MRL), and RCRA metals that were either non-detectable above the MRL or were below the ADEC cleanup criteria. Sample S-4, collected from a depth of 12 feet bg, was analyzed for VOCs and exhibited concentrations of PCE, ethylbenzene, toluene, 1,2,4-trimethylbenzene, and

1,3,5-trimethylbenzene above the ADEC cleanup criteria. This sample also exhibited concentrations of n-butylbenzene, sec-butylbenzene, cis-1,2 dichloroethylene, isopropylbenzene, p-Isopropyltoluene, naphthalene, and xylenes below the ADEC cleanup criteria, where a cleanup value was published. This sample was also analyzed for RCRA metals, and exhibited concentrations of arsenic, barium, cadmium, and chromium above the ADEC cleanup criteria. Lead was also detected at 996 ppm, just slightly below the ADEC cleanup criterion for this compound for a commercial site. A sample (S-1) was collected from beneath the piping run to the wood crib that appeared to be cracked. The sample was collected from 8 feet bg, and exhibited 253 ppm RRO. This sample was also analyzed for RCRA metals, and exhibited a concentration of arsenic above the ADEC cleanup criterion.

An underground storage tank which appeared to be empty, was discovered during the exposure of the piping to the wooden crib in the northeastern portion of the property, with an approximate capacity of 500 gallons. One soil sample (S-7) was collected from a depth of 7 feet bg, and analyzed for DRO, and exhibited a concentration of 223 ppm. Another sample (S-11), collected beneath a 1,000-gallon UST located in the northeastern area of the property from a depth of 9 feet bg, exhibited non-detectable concentrations of DRO. Approximately 1-inch of residual product was remaining in the tank.

Three monitoring wells were installed and sampled in October of 1997: two wells (MW-2 and MW-3) were installed in the eastern portion of the property (most likely EPM-1 and EPM-2); one well was installed in the northwest portion of the property (MW-1), which is still viable. The groundwater samples from MW-1 and MW-2 were analyzed for VOCs, metals, and petroleum hydrocarbons. The analyses for MW-1 indicated that metals and petroleum were non-detectable above the MRL, and PCE was exhibited at a concentration of 4.250 ppm. The analyses for MW-2 indicated that no concentrations above the MRLs were exhibited for these analytes. Monitoring Well MW-3 was only analyzed for VOCs, and did not detect any VOCs above the laboratory's MRL.

A Phase II ESA was also conducted by BGES during the summer of 2004. This Site Assessment included the advancement of six exploratory test pits with associated soil sampling, and removal of five hydraulic lifts, two associated hydraulic USTs, and two heating oil USTs, originally identified by EPMI. A relatively small volume of soil exhibiting hydrocarbon concentrations exceeding the ADEC cleanup criteria were encountered during the removal of the hydraulic lifts and associated USTs. The test pit excavations revealed numerous soil samples exhibiting PCE concentrations that exceeded the ADEC cleanup criterion. In addition, an existing monitoring

well (labeled MW-1) observed in the northwestern portion of the property was sampled in October of 2004. The groundwater sample collected from this well exceeded the ADEC cleanup criterion for PCE by four orders of magnitude.

Based on the results of the soil and groundwater sampling for the Phase II ESA in 2004, a drinking water well survey was completed, as well as the advancement of three soil borings that were completed as monitoring wells. Five water supply wells were located in the databases within ¼ mile of the subject property, however, none of these wells appeared to be operational. Soil samples were collected from the soil borings during advancement, and water samples were collected after the borings were completed as monitoring wells. The samples were analyzed for volatile organic compounds (VOCs). The soil and water samples exhibited PCE concentrations that were several orders of magnitude greater than the ADEC cleanup criterion. The lack of "daughter" constituents (tetrachloroethene (TCE) and 1,1 dichloroethylene (DCE), and vinyl chloride) associated with PCE in the laboratory analyses indicated that biodegradation of the contaminant had not been occurring at a significant rate. Groundwater at the site flows to the northeast, as determined from surveying of the monitoring wells. The horizontal extent of PCE contamination at the subject property had not been defined during the Phase II ESA, and the presence of PCE in shallow soils (less than about 12 feet bg) had not been determined; this work is the subject of this report.

3.0 ADDITIONAL SITE ASSESSMENT

Based on the findings of our Phase II ESA executed in 2004, and a request from the ADEC to further characterize and delineate the contamination at the subject property, five shallow soil borings were advanced to 15 feet bg in the western half of the subject property, and soil samples were collected from various depths. Three new monitoring wells were installed, one on site and two off site, to further delineate the extent of groundwater contamination. The new monitoring wells, as well as the existing monitoring wells, were sampled to evaluate groundwater quality trends. Groundwater elevations were also measured in the monitoring wells. The monitoring wells were also re-surveyed because new wells were installed, and because modifications to the top of the well casings were necessary to close the protective casings during the 2004 activities.

3.1 Shallow Soil Boring Advancement

Five soil borings were advanced on May 15, 2007 at the locations depicted on Figure 2. The soil borings were advanced by Discovery Drilling of Anchorage using a truck-mounted drill rig and

hollow-stem augers. Initially, direct-push drilling technology was to be employed, but the soil recovery was too minimal. The use of the direct-push technology would have minimized the generation of drill cuttings that would eventually require disposal as hazardous waste, as witnessed in previous soil boring advancements. The drill cuttings that were generated during the hollow-stem auger drilling process were contained in 55-gallon drums, and were stored on site with secured lids pending laboratory analysis to determine appropriate disposal options. The drums were labeled as to the contents, the potentially hazardous nature of the contents, and a name and telephone number to contact in the event of an emergency.

The objective of the advancement of the soil borings was to evaluate the condition of the shallow soils on site since previous soil samples exhibited concentrations of PCE at various depths, but no samples had been collected from a depth shallower than 15 feet. The soil borings were advanced to approximately 15 feet bgs. The soil boring locations were documented by recording "swing-tie" measurements from fixed reference points at the site.

Continuous sampling was undertaken during the boring advancement, using 24-inch split-spoon samplers. The split-spoon samplers were decontaminated prior to each use by washing them in an Alconox (laboratory-grade) detergent solution. Water that was generated during the washing of the split-spoons was placed in a drum on site and was labeled as described above.

Upon retrieval of the split-spoon sampler, a portion of the soil from the entire length of the sampler was placed in a sealable plastic bag, which was labeled with a unique sample number and the time of sample collection. The bagged sample was allowed to warm to room temperature for at least 10 minutes, and within one hour of collection, the sample was screened using a photoionization detector (PID). The sample was screened by agitating the bag for approximately 15 seconds, and then the tip of the PID was inserted into the bag and the greatest PID reading was recorded. The PID was calibrated using 100 ppm isobutylene calibration gas prior to use. The PID screening results are presented in Table 1. A second portion of the soil from the split-spoon sampler was placed in laboratory-supplied containers for potential laboratory analysis. The samples for volatile analyses were collected first and preserved with methanol, as soon as was practical after collection. After the laboratory containers were filled, the remaining soil in the split-spoon sampler was described and recorded into a geologic log (Appendix B – Soil Boring Logs).

The soil sample with the greatest PID reading from each boring, as well as a soil sample from

each soil boring from 0 to 2 feet bg, were submitted to SGS Environmental Services (SGS) in Anchorage, an ADEC-approved laboratory, for analyses. The PID results from all soil boring activities are listed in Table 1. Samples collected below 2 feet bg were combined from two consecutive split-spoon samplers in accordance with our Work Plan to collect soils from 5-foot intervals. The samples were analyzed for gasoline range organics (GRO) by Alaska Method (AK) 101; diesel range organics (DRO) by AK 102; residual range organics (RRO) by AK 103; volatile organic compounds (VOCs) by EPA Method 8260B; Resource Conservation and Recovery Act (RCRA) metals by EPA Method 6000/7000. Additional samples were submitted to SGS from each soil boring, collected from various depths, and were analyzed for total organic carbon (TOC) by EPA 415.1. As quality control measures, a duplicate soil sample was collected and submitted blindly to the laboratory, and a trip blank sample accompanied the samples scheduled for volatile analyses during the entire sampling and handling process. Analytical soil sampling results are included in Table 2.

The western half of the subject property was divided into thirds, creating six areas as shown on Figure 2. Each area was labeled either Grid A, B, C, D, E, or F. Soil borings were advanced in each grid, except for Grid B, since two monitoring wells were previously installed in this grid and the soils were previously characterized. Samples were labeled with the grid letter, followed by the sample number, and then the depth from which the sample was collected. For example, soil sample A1/0-2 was collected from Grid A, sample 1, from a depth of 0 to 2 feet bg.

Two samples were submitted for laboratory analysis from Grid A, which was located towards the southwestern portion of the subject property. Sample A1/0-2 was collected from ground surface to 2 feet bg, and was analyzed for TOC in addition to the other analyses described above. The second sample submitted for analysis from Grid A was labeled A4/9-13, and was collected from a depth of 9 to 13 feet bg. As discussed earlier, this sample was combined from two consecutive 24-inch split-spoon samplers.

Three samples and one duplicate sample were analyzed from Grid C, which was located towards the southern portion of the property, east of Grid A (Figure 2). Sample C1/0-2 was collected at a depth from 0 to 2 feet bg; soil sample C2/2-6 was collected at a depth of 2 to 6 feet bg, and was analyzed only for TOC; and sample C3/6-10 was collected from a depth of 6 to 10 feet bg, and had the greatest PID reading for this Grid. A duplicate soil sample was collected at this depth and submitted blindly to the laboratory as G3/6-10.

Three samples were analyzed from Grid D, which was located towards the north-central portion of the grid area (Figure 2). Sample D1/0-2 was collected from a depth of 0 to 2 feet bg; sample D3/6-10 was collected from a depth of 6 to 10 feet bg and was analyzed only for TOC; and D5/12-14 was collected from a depth of 12 to 14 feet, and had the greatest PID reading of all the Grids. This sample was collected from one split-spoon sampler only since the PID reading increased from 2 ppm to 46 ppm within 2 feet.

Three samples were analyzed from Grid E, which was located towards the southeast portion of the grid area (Figure 2). Sample E1/0-2 was collected at a depth of 0 to 2 feet bg; sample E2/2-6 was collected from a depth of 2 to 6 feet bg; and sample E4/10-14 was collected from a depth of 10 to 14 feet, and was analyzed only for TOC.

Three samples were analyzed from Grid F, which was located towards the northeastern portion of the grid area (Figure 2). Sample F1/0-2 was collected from a depth of 0 to 2 feet bg; sample F3/6-10 was collected from a depth of 6 to 10 feet bg, and was analyzed only for TOC; sample F4/10-14 was collected from a depth of 10 to 14 feet bg, and had the greatest PID reading for this soil boring.

3.2 Monitoring Well Installation

After receiving permission from adjacent landowners to the north of the subject property, soil borings, completed as monitoring wells, were advanced to evaluate potential impacts originating from the subject property, and to delineate the remaining extent of contamination to the southwest. Three soil borings/monitoring wells were installed during mid-July of 2007, at the approximate locations depicted on Figure 2. The soil borings/monitoring wells were advanced to approximately 5 feet below the groundwater table, which was encountered at approximately 40 feet bgs. Care was exercised not to breach the clay layer that appeared to be located at approximately 45 feet bg in the vicinity of the site. Continuous soil screening samples were obtained from MW-5 using a split-spoon sampler, as described above, at 2-foot intervals beginning at 5 feet bg until 5 feet below the water table; soil screening samples were collected from Monitoring Wells MW-6 and MW-7 at 3-foot intervals beginning at ground surface until the soils exhibited ambient air PID results above 0 ppm, then continuous sampling was undertaken. If the ambient air PID readings ceased to have readings above 0 ppm, then soil screening samples were collected again from 3-foot intervals. Soil samples were collected for screening and potential laboratory analyses, and selected soil samples were analyzed for the

same constituents as described above in Section 3.1. Three soil samples were selected for laboratory analyses from each soil boring: one sample from the 0 to 15 foot bg interval; one sample from the 15 to 30 foot bg interval; and one sample from the 30 to 45 foot bg interval. An additional sample was collected from each soil boring/monitoring well at various depths that appeared to have little or no volatile constituents during the sampling process and was analyzed for TOC. Samples were labeled with the future monitoring well (MW) number, followed by the depth from which the sample was collected. For example, soil sample MW-5-40/42 was collected from Monitoring Well 5, from a depth of 40 to 42 feet bg. Furthermore, Soil Boring 1 was completed as Monitoring Well 5; Soil Boring 2 was completed as Monitoring Well 6; and Soil Boring 3 was completed as Monitoring Well 7. Drill cuttings that were generated during the drilling processes were contained in 55-gallon drums and were stored on site separate from, but in a similar manner, as the soil cuttings generated during the shallow soil boring advancement, described above.

The samples collected from the soil borings/monitoring wells were submitted to Test America for analysis. As a quality control measure, a duplicate soil sample was collected from one of the soil borings. Four soil samples were collected from soil boring/monitoring well SB-1/MW-5, and analyzed for the constituents described above. This soil boring was advanced off site in the lot to the north of the subject property, and would eventually be completed as Monitoring Well MW-5 (Figure 2). Three of the soil samples, were labeled MW-5-15/17, MW-5-25/27, and MW-5-40/42, and were collected from depths of 15 to 17 feet bg, 25 to 27 feet bg, and 40 to 42 feet bg, respectively. A fourth sample, Sample MW-5-30/32 was collected at a depth of 30 to 32 feet bg and was analyzed only for TOC.

Four soil samples were analyzed from the second soil boring/monitoring well, SB-2/MW-6, and analyzed for the constituents described above. This soil boring was advanced off site in the lot to the north of the subject property, east of SB-1, and would eventually be completed as Monitoring Well MW-6. Three samples, MW-6-10-/12, MW-6-20/22, and MW-6-33/35 were collected from depths of 10 to 12 feet bg, 20 to 22 feet bg, and 33 to 35 feet bg, respectively. Sample MW-6-22.5/24.5 was collected at a depth of 22.5 to 24.5 feet bg and was analyzed only for TOC.

Four soil samples and one duplicate sample were collected from the third soil boring/monitoring well, SB-3/MW-7, and analyzed for the constituents described above. This soil boring was advanced in the southwest corner of the subject property. Three samples, MW-7-13/15, MW-7-

25/27, and MW-7-35/37 were collected from depths of 13 to 15 feet bg, 25 to 27 feet bg, 35 to 37 feet bg, respectively. Sample MW-7-32.5/34.5, collected from a depth of 32.5 to 34.5 feet bg, was analyzed only for TOC. A duplicate soil sample was collected from MW-7-35/37 and was labeled MW-7-40/42.

3.3 Monitoring Well Installation and Groundwater Sampling

Monitoring wells were installed in the three soil borings described above, at the approximate locations shown on Figures 2 and 3. The wells were drilled to approximately 5 feet below the ground water table, which was encountered at approximately 40 feet bgs in all three soil borings during advancement.

The monitoring wells were constructed using 2-inch diameter, PVC screens and casings. Monitoring Wells MW-5 and MW-6 were completed with 10 feet of 20-slot screen, and MW-7 was completed with 10 feet of 10-slot screen, that bisected the water table to ensure that the bottom of the screens were set below the base of the aquifer. The well screens were enveloped in a sand pack consisting of 10/20-sized silica sand. The well screen was coupled to a PVC well casing, and completed by adding an additional 2 feet of clean sand to the annular space above the well screen, followed by a bentonite chip seal. Monitoring wells MW-5 and MW-6, installed on the adjacent properties to the north of the subject property, were constructed with above-grade protective casings. Monitoring well MW-7, installed in the southwest corner of the subject property, was constructed with a flush-mount protective casing. Cement seals at grade level were placed around all of the wells. The monitoring well construction diagrams are included in Appendix C.

The newly installed monitoring wells were developed using a disposable polyethylene bailer until the discharge was relatively sediment-free, or until approximately 5 gallons of water had been removed from each of the wells. The purge water was contained in 5-gallon buckets and transferred to a 55-gallon drum on site. The drum was labeled and stored on site as described above for the soil cuttings, awaiting characterization for disposal.

The ADEC had requested that the wells be purged and sampled in accordance with EPA's low-flow (minimal drawdown) technique (EPA Memo 540/S-95/504); however, because the depth of the wells were greater than 30 feet bg, this technique could not be employed. Groundwater samples were collected with a bailer, and when necessary, non-volatile samples were decanted into a new sample jar to reduce the volume of sediment in the sample.

To aid in determining the groundwater flow direction, groundwater elevations were measured in each new well and in each existing well during a short time interval prior to sampling with a decontaminated, electronic water-level indicator. The water level indicator was decontaminated by washing it in an Alconox (laboratory-grade detergent solution) followed by a potable water and then distilled water rinse. Also, the top of the monitoring well casings and the ground surface elevations at each new monitoring well were surveyed relative to the existing monitoring wells and to a fixed reference point upon completion. The top of casings and ground surface elevations of the existing monitoring wells were also surveyed. The elevations of these features were recorded to the nearest 0.01 foot. The top of casing elevation for MW-4 was surveyed to a different reference point than the other wells because of the presence of vehicles that obstructed our line of sight. This second reference point was inadvertently not tied in to the other monitoring wells. Therefore, the top of casing elevation utilized for MW-4 was obtained by determining the difference in elevation exhibited between this well and another well based on the previous survey. The horizontal locations of the monitoring wells were measured relative to a fixed reference point as described for the soil borings above.

Groundwater samples were collected from the four existing monitoring wells, and the three newly installed wells. An attempt was made to locate the two historical monitoring wells (EPM-2 and EPM-3) that may still be present on the subject property with a magnetic locator; however, these wells could not be found. The location of the seven groundwater monitoring wells, as well as the approximate locations of the two wells that could not be located, are depicted on Figure 3. During sampling, water quality measurements were recorded to determine when groundwater samples, representative of aquifer conditions, could be collected. Field parameters documented include temperature, pH, conductivity, dissolved oxygen, salinity, turbidity, and oxidation/reduction potential. These data are presented in Table 3. A minimum of three well volumes were purged from each monitoring well prior to collection of the water sample. Purge water was contained in 5-gallon buckets and then transferred to a 55-gallon drum on site, as discussed above.

Groundwater samples analyzed for volatile analysis (GRO and VOCs) were collected first by filling laboratory-supplied vials. Care was exercised when collecting the samples to ensure that no headspace was left within the vials and that none of the preservative was spilled. All other samples collected for non-volatile or semi-volatile analysis were collected next in laboratory-supplied jars. The samples were stored and transported in a chilled cooler and were delivered

under chain of custody protocol to Test America in Anchorage. The monitoring well locations, groundwater sample exceedances, and groundwater elevations and flow direction are represented on Figure 3. The groundwater flow direction is to the northeast at a gradient of approximately 0.01 foot per linear foot. Groundwater monitoring data are included in Table 3. Analytical results from the groundwater samples are discussed below in Section 4.2, and are listed in Table 4.

Groundwater samples were analyzed for the same parameters and by the same methods described in Section 3.1 above (except for the TOC). As a quality control procedure, a groundwater trip blank accompanied the samples during the entire sampling and transportation process. No duplicate samples were collected for quality control because the groundwater monitoring program is ongoing at this site. To aid in the design and monitoring of a potential remediation program, the following additional analyses were included in the analytical regime from one of the newly installed monitoring wells (MW-5) and also from MW-3, which exhibited the greatest PCE concentration during previous sampling: metabolic acids, including pyruvic, lactic, acetic, butyric, and propionic by volatile fatty acids (VFA); nitrates by EPA 353.1; sulfates by EPA 375.3; carbon dioxide, methane, ethane, and ethene by ASTM D 1945; total and dissolved iron and manganese by EPA 6000 series; and sulfides by EPA 376.2. These results are discussed separately from the other analytical results, in Section 4.3 and are presented in Table 5.

3.4 Hazardous Waste Disposal

Upon receipt of the laboratory analytical results from the soil boring samples, drill cuttings that were contained in drums on site were disposed of as hazardous waste through Emerald Alaska. Ten drums were manifested on August 24, 2007 to transport to a hazardous waste facility in Beatty, Nevada, for processing (Appendix D).

Upon receipt of the laboratory analytical results for the groundwater samples, the purge water from sampling activities and wash water from the soil borings was also disposed of as hazardous waste through Emerald Alaska. One drum was manifested on September 14, 2007 to transport to a hazardous waste facility in Aragonite, Utah, for processing (Appendix D).

4.0 EVALUATION OF LABORATORY DATA

Laboratory samples were collected in laboratory-supplied jars and transported in chilled coolers, under chain of custody protocol, to either SGS Environmental Services or Test America in

Anchorage, Alaska. Both laboratories are ADEC-approved. Trip blanks accompanied the samples slated for volatile analyses at all times until submission to the laboratories, and were analyzed for GRO and VOCs. Previous laboratory samples collected from this site exhibited constituent concentrations that exceeded the ADEC cleanup criteria, which included PCE from numerous areas of the subject property. Lead was detected in the soils in 1997 at a depth of 12 feet bg in the northeastern portion of the subject property at 996 ppm, just below the ADEC cleanup criterion for a commercial site. As such, the laboratory samples were analyzed for the constituents described above in Sections 3.1 and 3.3. Results of the laboratory analyses are discussed below.

4.1 Soil Samples

The analytical results for the soil samples are summarized in Table 2 along with their corresponding PID results, and the complete laboratory reports are included in Appendix E. Table 1 lists all of the soil boring PID results. The analytical results are compared to the ADEC Method 2 Cleanup Criteria (under 40-inch zone), Migration to Groundwater, listed in 18AAC 75.341 - Table B2 [300 milligrams per kilogram (mg/Kg) for GRO, 250 mg/Kg for DRO, 10,000 for RRO], and 18AAC75.341 - Table B1 (0.02 mg/Kg for benzene, 5.4 mg/Kg for toluene, 5.5 mg/Kg for ethylbenzene, 78 mg/Kg for total xylenes, 1.4 mg/Kg for mercury, 2 mg/Kg for arsenic, 1,100 mg/Kg for barium, 5 mg/Kg for cadmium, 26 mg/Kg for chromium, 400 mg/Kg for lead, 3.5 mg/Kg for selenium, and 21 mg/Kg for silver, 0.03 mg/Kg for PCE, and 0.027 mg/Kg for TCE). All other results for VOCs did not exhibit concentrations above the practical quantitation limit (PQL).

Soil samples were collected from the shallow soil borings advanced in mid May of 2007 and were submitted to SGS. Soil samples collected from the monitoring well soil boring advancements in mid July of 2007 were submitted to Test America. These samples were analyzed for GRO by AK 101; DRO and RRO by AK 102/103; VOCs by Method 8260; and RCRA metals by Method 6020. Selected soil samples were additionally analyzed for TOC by either SGS's standard operating procedure, or Test America by Method SW846 9060M.

Soil samples were collected at various depths from the shallow soil borings in five areas of the subject property (Figure 2). Soil Boring A was advanced in the southwestern portion of the property. Two soil samples were collected and analyzed for the parameters described above, as well as one soil sample which was analyzed for TOC and is discussed in Section 4.3. Soil

sample A1/0-2, collected from a depth of ground surface to 2 feet bg, exhibited concentrations of arsenic (4.83 mg/Kg), chromium (39.2 mg/Kg), and PCE (1.540 mg/Kg), all of which exceed the ADEC cleanup criteria. Concentrations of RRO, barium, cadmium, and lead were exhibited below the respective ADEC cleanup criteria. Concentrations of GRO, DRO, mercury, selenium, silver, and all other VOCs besides PCE, were not detected above the laboratory's PQL. The second soil sample collected from Soil Boring A was collected from a depth of 9 to 13 feet bg. This sample, A4/9-13, exhibited concentrations of arsenic (4.75 mg/Kg), chromium (27.1 mg/Kg), and PCE (49.500 mg/Kg), all of which exceed the ADEC cleanup criteria. Concentrations of GRO, barium, and lead were exhibited below the ADEC cleanup criteria. Concentrations of DRO, RRO, mercury, cadmium, selenium, silver, and all other VOCs besides PCE, were not detected above the PQL.

Soil Boring C was advanced east of Soil Boring A, in the southern portion of the subject property (Figure 2). Two soil samples, as well as a duplicate soil sample, were collected and analyzed for the parameters described above, and one additional soil sample was analyzed for TOC, which is discussed in Section 4.3 below. Soil sample C1/0-2, collected from a depth of ground surface to 2 feet bg in Soil Boring C, exhibited concentrations of arsenic (6.85 mg/Kg), chromium (37.3 mg/Kg), and PCE (1.270 mg/Kg), all of which exceed the ADEC cleanup criteria. Concentrations of RRO, mercury, barium, cadmium, lead, selenium, and silver were exhibited below the ADEC cleanup criteria. Concentrations of GRO, DRO, and all other VOCs besides PCE, were not detected above the PQL. The second soil sample analyzed from Soil Boring C was collected at a depth of 6 to 10 feet bg. This sample, C3/6-10, exhibited concentrations of arsenic (5.70 mg/Kg), chromium (33.3 mg/Kg), and PCE (1.570 mg/Kg), all of which exceed the ADEC cleanup criteria. Concentrations of mercury, barium, cadmium, and lead were exhibited below the ADEC cleanup criteria. Concentrations of GRO, DRO, RRO, selenium, silver, and all other VOCs besides PCE, were not detected above the PQL; however, GRO, DRO, RRO, selenium, and silver were estimated below the PQL. A duplicate soil sample, collected from C3/6-10, was submitted blindly to the laboratory as G3/6-10, and exhibited concentrations of arsenic (6.19 mg/Kg), chromium (35.8 mg/Kg), and PCE (3.850 mg/Kg), all of which exceed the ADEC cleanup criteria. Concentrations of GRO, DRO, RRO, mercury, barium, cadmium, lead, selenium, and silver were exhibited below the ADEC cleanup criteria; however, GRO, DRO, selenium, and silver were estimated values below the PQL. All other VOCs, besides PCE, were non-detectable.

Soil Boring D was advanced north of Soil Boring C, towards the northern portion of the subject property (Figure 2). Two soil samples were collected and analyzed for the parameters described above, and one additional soil sample was analyzed for TOC, which is discussed in Section 4.3 below. Soil sample D1/0-2, collected from a depth of ground surface to 2 feet bg, exhibited concentrations of arsenic (7.05 mg/Kg), chromium (35.4 mg/Kg), PCE (10.400 mg/Kg), and TCE (0.0439 mg/Kg), all of which exceed the ADEC cleanup criteria. Concentrations of GRO, RRO, mercury, barium, cadmium, and lead, were exhibited below the ADEC cleanup criteria. Concentrations of DRO, selenium, and silver were estimated below the PQL, and all other VOCs besides PCE and TCE, were not detected above the PQL. The second soil sample analyzed from Soil Boring D was collected from a depth of 12 to 14 feet bg. This sample, D5/12-14, exhibited concentrations of arsenic (4.56 mg/Kg), chromium (31.4 mg/Kg), PCE (821.000 mg/Kg), and TCE (0.0352), all or which exceed the ADEC cleanup criteria. Concentrations of GRO, DRO, RRO, mercury, barium, cadmium, and lead, were exhibited below the ADEC cleanup criteria. Concentrations of toluene, P&M xylenes, selenium, silver, and all other VOCs besides PCE and TCE, were not detected above the PQL; however, toluene, P&M xylenes, selenium, and silver were estimated below their respective PQLs.

Soil Boring E was advanced east of Soil Boring C, towards the southern portion of the subject property (Figure 2). Two soil samples were collected and analyzed for the parameters described above, and one additional soil sample was analyzed for TOC, which is discussed in Section 4.3 below. Soil sample E1/0-2, collected from a depth of ground surface to 2 feet bg, exhibited concentrations of arsenic (7.02 mg/Kg), chromium (33.2 mg/Kg), and PCE (1.350 mg/Kg), all of which exceed the ADEC cleanup criteria. Concentrations of RRO, mercury, barium, cadmium, lead, selenium, and silver, were exhibited below the ADEC cleanup criteria. Concentrations of GRO, DRO, and all other VOCs besides PCE, were not detected above the PQL. The second soil sample collected from Soil Boring E, E2/2-6, was collected from a depth of 2 to 6 feet bg, and exhibited concentrations of arsenic (7.12 mg/Kg), chromium (37.1 mg/Kg), and PCE (0.359 mg/Kg), all of which exceed the ADEC cleanup criteria. Concentrations of RRO, mercury, barium, cadmium, and lead, were exhibited below the ADEC cleanup criteria. Concentrations of GRO, DRO, selenium, silver, and all other VOCs besides PCE, were not detected above the PQL.

Soil Boring F was advanced north of Soil Boring E, towards the northern portion of the subject property (Figure 2). Two soil samples were collected and analyzed for the parameters described

above, and one additional soil sample was analyzed for TOC, which is discussed in Section 4.3 below. Soil sample F1/0-2, collected from a depth of ground surface to 2 feet bg, exhibited concentrations of arsenic (9.08 mg/Kg), chromium (29.9 mg/Kg), and PCE (13.200 mg/Kg), all of which exceed the ADEC cleanup criteria. Concentrations of GRO, RRO, mercury, barium, cadmium, lead, selenium, and silver, were exhibited below the ADEC cleanup criteria. Concentrations of DRO and all other VOCs besides PCE, were not detected above the PQL; however, DRO was estimated below the PQL. The second soil sample analyzed from Soil Boring F was collected from a depth of 10 to 14 feet bg. This sample, F4/10-14, exhibited concentrations of arsenic (5.09 mg/Kg), chromium (30.8 mg/Kg), and PCE (10.700 mg/Kg), all of which exceed the ADEC cleanup criteria. Concentrations of GRO, RRO, mercury, barium, cadmium, and lead, were exhibited below the ADEC cleanup criteria. Concentrations of DRO, selenium, silver, and all other VOCs besides PCE, were not detected above the PQL; however, DRO, selenium, and silver were estimated below their respective PQLs.

Soil samples were also collected from three soil borings that were completed as monitoring wells during mid-July of 2007. The samples were submitted to Test America and were analyzed for the same constituents described above. The PID results from the soil boring activities are listed in Table 1, and the locations of the soil borings and analytical exceedences are depicted on Figure 2.

Soil Boring 1 (SB-1) was advanced on an adjacent property to the north of the subject property. The first sample analyzed from SB-1 was collected at a depth of 15 to 17 feet bg. This sample, MW-5-15/17, exhibited concentrations of arsenic (3.37 mg/Kg) and PCE (2.89 mg/Kg), all of which exceed the ADEC cleanup criteria. Concentrations of barium, chromium, lead, and silver were exhibited below the ADEC cleanup criteria. Concentrations of GRO, DRO, RRO, mercury, cadmium, selenium, and all other VOCs besides PCE, were not detected above the PQL. The second sample analyzed from SB-1, sample MW-5-25/27, collected from a depth of 25 to 27 feet bg, exhibited concentrations of arsenic (4.47 mg/Kg), chromium (28.8 mg/Kg), and PCE (2.40 mg/Kg), all of which exceed the ADEC cleanup criteria for these analytes. Concentrations of barium and lead were exhibited below the ADEC cleanup criteria. Concentrations of GRO, DRO, RRO, mercury, cadmium, selenium, silver, and all other VOCs besides PCE, were not detected above the PQL. The third sample, MW-5-30/32, collected from a depth of 30 to 32 feet bg, was analyzed only for TOC and is discussed below in Section 4.3. The fourth sample analyzed from SB-1 was collected at a depth of 40 to 42 feet bg. This sample, MW-5-40/42,

exhibited concentrations of arsenic (3.68 mg/Kg), chromium (31.0) and PCE (12.4 mg/Kg), all of which exceed the ADEC cleanup criteria. Concentrations of GRO, barium, and lead, were exhibited below the ADEC cleanup criteria. Concentrations of DRO, RRO, mercury, cadmium, selenium, silver, and all other VOCs besides PCE, were not detected above the PQL.

The first sample from the second soil boring, SB-2, was collected at a depth of 10 to 12 feet bg. Soil boring SB-2 was located in a lot adjacent to the subject property to the north, east of SB-1. This sample, MW-6-10/12, exhibited concentrations of arsenic (4.61 mg/Kg), chromium (31.5) and PCE (0.908 mg/Kg), all of which exceed the ADEC cleanup criteria. Concentrations of barium and lead were exhibited below the ADEC cleanup criteria. Concentrations of GRO, DRO, RRO, mercury, cadmium, selenium, silver, and all other VOCs besides PCE, were not detected above the PQL. The second sample analyzed from SB-2 was collected at a depth of 20 to 22 feet bg. This sample, MW-6-20/22, exhibited concentrations of arsenic (4.45 mg/Kg), chromium (33.7) and PCE (0.865 mg/Kg), all of which exceed the ADEC cleanup criteria. Concentrations of barium and lead were exhibited below the ADEC cleanup criteria. Concentrations of GRO, DRO, RRO, mercury, cadmium, selenium, silver, and all other VOCs besides PCE, were not detected above the PQL. The third sample analyzed from SB-2 was collected at a depth of 33 to 35 feet bg. This sample, MW-6-33/35, exhibited concentrations of arsenic (3.76 mg/Kg), chromium (33.5 mg/Kg) and PCE (2.38 mg/Kg), all of which exceed the ADEC cleanup criteria. Concentrations of barium and lead were exhibited below the ADEC cleanup criteria. Concentrations of GRO, DRO, RRO, mercury, cadmium, selenium, silver, and all other VOCs besides PCE, were not detected above the PQL.

The first sample analyzed from the third soil boring, SB-3, was collected at a depth of 15 to 17 feet bg. This sample, MW-7-15/17, exhibited concentrations of arsenic (4.02 mg/Kg), chromium (28.0) and PCE (1.99 mg/Kg), all of which exceed the ADEC cleanup criteria. Concentrations of barium and lead were exhibited below the ADEC cleanup criteria. Concentrations of GRO, DRO, RRO, mercury, cadmium, selenium, silver, and all other VOCs besides PCE, were not detected above the PQL. The second sample analyzed from soil boring SB-3 was collected at a depth of 25 to 27 feet bg. This sample, MW-7-25/27, exhibited concentrations of arsenic (3.90 mg/Kg), chromium (32.8) and PCE (3.47 mg/Kg), all of which exceed the ADEC cleanup criteria. Concentrations of barium and lead were exhibited below the ADEC cleanup criteria. Concentrations of GRO, DRO, RRO, mercury, cadmium, selenium, silver, and all other VOCs besides PCE, were not detected above the PQL. The third sample analyzed from soil boring SB-

3 was collected at a depth of 35 to 37 feet bg. This sample, MW-7-35/37, exhibited concentrations of arsenic (4.52 mg/Kg), chromium (34.0), and PCE (3.84 mg/Kg), all of which exceed the ADEC cleanup criteria. Concentrations of barium and lead were exhibited below the ADEC cleanup criteria. Concentrations of GRO, DRO, RRO, mercury, cadmium, selenium, silver, and all other VOCs besides PCE, were not detected above the PQL.

The fourth sample analyzed from soil boring SB-3 was collected at a depth of 40 to 42 feet bg. This sample, MW-7-40/42, exhibited concentrations of arsenic (4.04 mg/Kg), chromium (27.8), and PCE (2.53 mg/Kg), all of which exceed the ADEC cleanup criteria. Concentrations of barium and lead were exhibited below the ADEC cleanup criteria. Concentrations of GRO, DRO, RRO, mercury, cadmium, selenium, silver, and all other VOCs besides PCE, were not detected above the PQL.

4.2 Groundwater Samples

Seven groundwater monitoring wells were sampled in late August of 2007. These samples were analyzed by Test America for GRO by AK 101; DRO and RRO by AK 102/103; VOCs by Method 8260, and RCRA metals by Method 6020. Selected water samples (MW-3 and MW-5) were additionally analyzed for metabolic acids, including pyruvic, lactic, acetic, butyric, and propionic by volatile fatty acids (VFA) method; nitrates by EPA 353.1; sulfates by EPA 375.3; carbon dioxide, methane, ethane, and ethene by ASTM D 1945; total and dissolved iron and manganese by EPA 6000 series; and sulfide by EPA 376.2. These additional analytes are discussed in Section 4.3 below.

The water sample results are compared to the ADEC criteria listed in 18AAC 75.345 - Table C [1.5 milligrams per liter (mg/L) for DRO, 1.1 mg/L for RRO, 1.3 mg/L for GRO, and 0.005 mg/L for PCE]. All other results for VOCs did not exhibit concentrations above the MRL.

The groundwater sample collected from Monitoring Well MW-1 exhibited a PCE concentration of 0.154 mg/L, which exceeds the ADEC cleanup criterion. This well also exhibited a GRO concentration of 0.0705 mg/L, which is below the ADEC cleanup criterion. The sample collected from this well did not contain detectable concentrations of DRO, RRO, and all other VOCs, besides PCE, above the MRLs.

The groundwater sample collected from Monitoring Well MW-2 exhibited a PCE concentration of 0.115 mg/L, which exceeds the ADEC cleanup criterion. This well also exhibited a GRO concentration of 0.102 mg/L, which is below the ADEC cleanup criterion. The sample collected

from this well did not contain detectable concentrations of DRO, RRO, and all other VOCs, besides PCE, above the respective MRLs.

The groundwater sample collected from Monitoring Well MW-3 exhibited a PCE concentration of 0.338 mg/L, which exceeds the ADEC cleanup criterion. This well also exhibited a concentration of GRO at 0.0716 mg/L, which is below the ADEC cleanup criterion. The sample collected from this well did not contain DRO, RRO, and all other VOCs, besides PCE, contaminant concentrations that were detectable above the respective MRLs. Other parameters were analyzed in conjunction with this monitoring well sample, and are discussed in detail below in Section 4.3.

The groundwater sample collected from Monitoring Well MW-4 exhibited a PCE concentration of 0.0252 mg/L, which exceeds the ADEC cleanup criterion. The sample collected from this well did not contain GRO, DRO, RRO, and all other VOCs, besides PCE, contaminant concentrations that were detectable above the respective MRLs.

The groundwater sample collected from Monitoring Well MW-5 exhibited a PCE concentration of 0.523 mg/L, which exceeds the ADEC cleanup criterion. This well also exhibited concentrations of GRO at 0.202 mg/L and RRO at 0.488 mg/L, both of which are below the respective ADEC cleanup criteria. The sample collected from this well did not contain detectable concentrations of DRO and all other VOCs besides PCE, above the respective MRLs. Other parameters were analyzed in conjunction with this monitoring well sample, and are discussed in detail below in Section 4.3.

The groundwater sample collected from Monitoring Well MW-6 exhibited a PCE concentration of 0.822 mg/L, which exceeds the ADEC cleanup criterion. This sample also exhibited concentrations of GRO (0.384 mg/L) and TCE (0.00137 mg/L), but at concentrations less than the ADEC cleanup criteria. The sample collected from this well did not contain detectable concentrations of DRO, RRO, and all other VOCs, besides PCE, above the respective MRLs.

The groundwater sample collected from Monitoring Well MW-7 exhibited a PCE concentration of 0.00510 mg/L, which exceeds the ADEC cleanup criterion. The sample collected from this monitoring well did not contain detectable concentrations of DRO, RRO, GRO, and all other VOCs, besides PCE, above the respective MRLs.

4.3 Additional Parameters Analyzed

Additional parameters were analyzed from both the soil and water samples to aid in the design and monitoring of a potential remediation program. Monitoring Wells MW-3 and MW-5 samples were additionally analyzed for the following parameters: methane; ethane; ethene; nitrate/nitrite - nitrogen; dissolved sulfide; sulfate; iron; magnesium; acetic acid; butyric acid; formic acid; lactic acid; propionic acid; pyruvic acid; and carbon dioxide.

The groundwater sample collected from Monitoring Well MW-3 exhibited a concentration of nitrates/nitrite - nitrogen at 7.62 mg/L; sulfate at 30.7 mg/L; iron at 62.0 mg/L; magnesium at 47.7 mg/L; and carbon dioxide at 24 mg/L. Acetic acid, butyric acid, formic acid, lactic acid, propionic acid, and pyruvic acid concentrations were not detectable above the PQL. The sample collected from this well did not contain methane, ethane, ethene, and dissolved sulfides above the respective MRLs. Although the ADEC does not have published cleanup criteria for these additional parameters, the drinking water maximum contaminant levels (MCLs) listed for nitrate/nitrite – nitrogen, sulfate, and iron, as listed in 18 AAC 80, are 10 mg/L, 250 mg/L, and 0.3 mg/L, respectively. The nitrate/nitrite – nitrogen and sulfate results for Monitoring Well MW-3 were below the MCL, whereas the iron concentration in MW-3 exceeded the MCL by 3 orders of magnitude.

The groundwater sample collected from Monitoring Well MW-5 exhibited concentrations of nitrates/nitrite - nitrogen at 6.68 mg/L; sulfates at 36.9 mg/L; iron at 136 mg/L; magnesium at 74.9 mg/L; and carbon dioxide at 36 mg/L. Acetic acid, butyric acid, formic acid, lactic acid, propionic acid, and pyruvic acid were not detectable above the PQL. The sample collected from this well did not contain detectable concentrations of methane, ethane, ethene, and dissolved sulfides above the respective MRLs. The nitrate/nitrite – nitrogen and sulfate results for Monitoring Well MW-5 were below the MCL, whereas iron exceeded the MCL by 4 orders of magnitude.

Total organic carbon was analyzed in various soil samples, collected at various depths, to also aid in the design of a potential remediation program. Five soil samples were collected from the shallow soil borings, and three soil samples were collected from the monitoring wells during installation. The samples were collected from intervals that appeared to have lower concentrations of contaminants so that the background (naturally occurring) carbon concentrations could be evaluated. The shallow soil boring samples were analyzed for TOC by

SGS by the laboratory's standard operating procedures. The remaining samples analyzed for TOCs were analyzed by Test America by Method SW846 9060M.

The five shallow soil borings samples were analyzed for TOC at various depths. Soil boring sample A1/0-2 exhibited 11,900 mg/Kg TOC, collected from ground surface to 2 feet bg; sample C2/2-6 exhibited 2,520 mg/Kg TOC collected from 2 feet to 6 feet bg; and sample D3/6-10 exhibited 2,330 mg/Kg TOC, collected from 6 feet to 10 feet bg; sample E4/10-14 exhibited 9,960 mg/Kg TOC collected from a depth of 10 to 14 feet bg; and sample F3/6-10 exhibited a concentration of 9,940 mg/Kg TOC collected from a depth of 6 to 10 feet bg.

Three soil samples were collected from the soils during the monitoring well advancements and were also analyzed for TOC. Samples MW-5-30/32, collected from a depth of 30 to 32 feet bg, and sample MW-6-22.5/24.5, collected from a depth of 22.5 to 24.5 feet bg, exhibited less than 1,000 mg/Kg TOC, below the MRL. Sample MW-7-32.5/34.5, collected from a depth of 32.5 to 34.5 feet bg, exhibited a concentration of TOC of 519,000 mg/Kg. The high TOC value may be related to organic material that was identified in the boring a few feet below this depth.

5.0 LABORATORY DATA QUALITY REVIEW

Data quality was reviewed in accordance with ADEC guidance and standard industry practices. ADEC laboratory data review checklists are included in Appendix F for every laboratory work order submitted as part of this field work, and include an overview of the quality of the laboratory data. The laboratories qualified some of the data and additional data were qualified by BGES as a result of the data quality review. These qualifiers are defined in Tables 2 through 4, which present the analytical results. The following sections discuss our evaluation of sample conditions and laboratory procedures during the 2007 sampling events.

5.1 Soil Samples

Analysis of the shallow soil borings was performed by SGS Environmental Services of Anchorage, and by Test America for the monitoring well soil sampling. Both of these laboratories are approved by the ADEC.

Work Order 1072273

Samples were hand-delivered to each laboratory by BGES personnel under chain of custody protocol. The cooler associated with work order 1072273 (SGS, submitted May 21, 2007)

arrived at the laboratory at a temperature of 6.3 dgrees. It is believed that this is the highest temperature that the samples were exposed to after their collection and therefore it is our opinion that the sample results are usable for their intended purpose. Samples contained the proper preservatives for the requested analyses and no unusual sample conditions were noted by either laboratory.

A method blank contained a concentration of GRO of 1.41, less than the PQL, but greater than the method detection limit (MDL). Many samples have PQLs less than this concentration. In addition some GRO results were reported by the laboratory at concentrations below the PQL. For this reason, samples that have detectable readings above the PQL and are within 5 times the amount detected in the method blank, or with results that are between the PQL and the MDL - Samples A4/9-13, C3/6-10, G3/6-10, D1/0-2, F1/0-2, and F4/10-14 - have been qualified as estimates due to this QC failure. GRO results in samples C3/6-10 and G3/6-10 were reported as estimates below their respective PQLs, and below the concentration of GRO detected in the method blank. The presence of GRO in these samples is suspect and these GRO results are also qualified as estimates. No other blanks associated with this project contained detectable concentrations of contaminants of concern.

The case narrative noted numerous QC failures associated with the shallow soil boring samples. The initial calibration verification (ICV) recoveries for the VOCs analyses did not meet the laboratory QC criteria, and were biased high; however, these analytes (1,1,2-trichloro-1,2,2-trifluoromethane, carbon disulfide, methyl-t-butyl ether, and 1-chlorohexane) were not detected in the associated samples (A1/0-2, A4/9-13, C1/0-2, C3/6-10, D1/0-2, D5/12-14, E1/0-2, E2/2-6, F1/0-2, F4/10-14, G3/6-10), and thus these results have not been qualified as estimates. The continuing calibration verification (CCV) recovery for several analytes exceeded QC goals. These analytes were not detected in associated samples; data usability is not affected and no samples have been qualified as a result of this QC failure. The CCV recovery for the surrogate 1,2,-dichloroethane-d4 exceeded QC goals. The target analyte recoveries and the recovery of a second surrogate met QC goals. Data usability is not affected and no samples have been qualified as a result of this QC failure. A CCV sample associated with n-hexane exhibited recoveries that exceeded QC goals. This analyte was not detected in any of the associated samples. No results have been qualified as a result of this QC failure.

Samples C3/6-10, D1/0-2, D5/12-14, E1/0-2, F1/0-2, F4/10-14, G3/6-10 had elevated PQLs for toluene due to high concentration of PCE in the samples; however, the PQLs are below the ADEC cleanup criterion, thus data usability is not affected.

A matrix spike (MS) and matrix spike duplicate (MSD) were performed on sample C1/0-2. Recovery of tetrachloroethene (PCE) was less than QC goals. Samples with a similar matrix may be biased low for this analyte; samples A1/0-2, A4/9-13, C1/0-2, C3/6-10, D1/0-2, D5/12-14, E1/0-2, E2/2-6, F1/0-2, F4/10-14, and G3/6-10, results have been qualified as estimates and are potentially biased low.

The laboratory noted that the MS for soil sample A1/0-2, analyzed for TOC, did not meet QC goals, and that the sample is non-homogeneous. Because of the reported non-homogenous nature of this sample, and the likely poor correlation with the matrices of soils collected at varying depths at the site, the TOC results are not qualified.

MS/MSDs were also performed on samples that were not submitted to the laboratory by BGES and these analyses failed to meet QC goals. These samples do not represent the matrix present at 4th and Gambell, so results have not been qualified as a result of this QC failure.

Internal laboratory QC failures caused one soil sample, D5/12-14, to be re-extracted and analyzed twice for PCE, which occurred two days outside of the 14-day holding time. Results for PCE in sample D5/12-14 are therefore potentially biased low due to the analysis being performed outside of the holding time. This analyte in the same sample result has already been qualified as an estimate due to a high recovery of a matrix spike in a sample with a similar matrix. Because the PCE concentration for this sample is five orders of magnitude above the ADEC cleanup criterion, it is our opinion that this datum is acceptable for its intended use.

Laboratory control sample (LCS) recoveries for vinyl chloride, 1,2-dichloroethane, carbon tetrachloride, bromomethane, chloroethane, trichlorofluoromethane, 1,2,4-trimethylbenzene, and 2,2-dichloropropane, were biased high. These analytes were not detected in associated samples; data usability is therefore not affected and no samples have been qualified as a result of this QC failure.

The LCS recovery for the surrogate 1,2,-dichloroethane-d4 exceeded QC goals for VOC analyses. The target analyte recoveries and the recovery of a second surrogate met QC goals; Data usability is not affected and no samples have been qualified as a result of this QC failure.

The 1,2,-dichloroethane-d4 surrogate recovery associated with samples A4/9-13, C1/0-2, C3/6-10, D1/0-2, D5/12-14, E1/0-2, and G3/6-10 exceeded QC goals. Associated detectable volatile results are potentially biased high and have been qualified as estimates. The 4-bromofluorobenzene surrogate recovery associated with the GRO analysis in sample F1/0-2 was less than QC goals due to high moisture content in the sample. The adjusted surrogate recovery is 69 percent, within data QC goals. No samples have been qualified as a result of this QC failure.

The n-triacontane-d62 surrogate recovery associated with the DRO/RRO analysis in sample F1/0-2 exceeded QC goals. Because the other surrogate recovery met QC goals, no samples have been qualified as a result of this QC failure.

The 1,2,-dichloroethane-d4 surrogate recovery associated with samples F1/0-2 and F4/10-14 for VOC analysis exceeded QC goals, and the recovery of toluene-d8 was less than QC goals. Associated detectable volatiles have been qualified as estimates.

The pattern of the chromatogram for sample E2/2-6 was reported by the laboratory to be consistent with lube oil.

The laboratory noted that the chromatograms for samples F4/10-14 and G3/6-10 analyzed for RRO were "unknown hydrocarbon with several peaks is present."

Work Order AQG0094

Samples were hand-delivered to each laboratory by BGES personnel under chain of custody protocol. The cooler associated with work order AQG0094 (Test America, submitted July 23, 2007) arrived at the laboratory within the allowable temperature range of 4 degrees +/- 2 degrees Celsius. Samples contained the proper preservatives for the requested analyses and no unusual sample conditions were noted by either laboratory.

A MS/MSD pair was analyzed on samples that were not submitted to the laboratory by BGES and these analyses failed to meet QC goals. These samples do not represent the matrix present at 4th and Gambell, so results have not been qualified as a result of this QC failure.

The surrogate recoveries associated with an internal laboratory duplicate carried out on samples that were not submitted by BGES as part of this project failed to meet QC goals. This

occurrence may be due to the matrix of the particular sample that the surrogate was added to, therefore, no results have been qualified as a result of this QC failure.

Relative percent differences (RPDs) associated with several metals analyzed in an internal laboratory duplicate failed to meet QC goals due to non-detectable concentrations of analytes in the original sample. The RPD associated with silver in a laboratory duplicate sample exceeded QC goals. Silver was not detected in any of the project samples; therefore, no results have been qualified as a result of this QC failure.

Work Order AQG0102

Samples were hand-delivered to each laboratory by BGES personnel under chain of custody protocol. The cooler associated with work order AQG0102 (Test America, submitted July 24, 2007) arrived at the laboratory within the allowable temperature range of 4 degrees +/- 2 degrees Celsius. Samples contained the proper preservatives for the requested analyses and no unusual sample conditions were noted by either laboratory.

The recovery of all three surrogates associated with the 8260 analysis performed on Sample Numbers MW-6-20/22 and MW-6-33/35 exceeded QC goals. Associated detectable volatile results are potentially biased high and have been qualified as estimates. As described above, all of the PCE results are significantly above the ADEC cleanup criterion, thus, it is our opinion that such a bias does not affect the usability of the data.

Trip blanks accompanied the volatile samples (GRO and VOCs) through the entirety of the sampling process and delivery to the laboratory. The surrogate trifluorotoluene was detected in one GRO trip blank at 11.1 mg/Kg in work order AQG0102, which may bias the surrogate recovery in associated samples high. Associated samples include soil samples MW-6-10/12, MW-6-20/22, and MW-6-33/35. These samples contained non-detectable concentrations of GRO and had acceptable surrogate recoveries for trifluorotoluene. Because the surrogate recovery may be biased high, these non-detectable sample results were qualified "UJ" as estimated on Table 2.

A MS/MSD pair was analyzed on samples that were not submitted to the laboratory by BGES and these analyses failed to meet QC goals. These samples do not represent the matrix present at the subject property, so results have not been qualified as a result of this QC failure.

The surrogate recoveries associated with an internal laboratory duplicate analyzed on samples that were not submitted by BGES as part of this project failed to meet QC goals. This occurrence may be due to the matrix of the particular sample that the surrogate was added to, therefore, no results have been qualified as a result of this QC failure.

RPDs associated with several metals analyzed in an internal laboratory duplicate failed to meet QC goals due to non-detectable concentrations of analytes in the original sample. The RPD associated with silver in a laboratory duplicate sample exceeded QC goals. Silver was not detected in any of the project samples; therefore, no results have been qualified as a result of this QC failure.

Work Order AQG0103

The recovery of two out of three surrogates associated with the 8260 analysis performed on sample number MW-7-15/17 exceeded QC goals. Associated detectable volatile results are potentially biased high and have been qualified as estimates. As described above, all of the PCE results are significantly above the ADEC cleanup criterion, thus, it is our opinion that such a bias does not affect the usability of the data.

The recovery of all three surrogates associated with the 8260 analysis performed on sample number MW-7-25/27, MW-7-35/37, and MW-7-40/42 exceeded QC goals. Associated detectable volatile results are potentially biased high and have been qualified as estimates. As described above, all of the PCE results are significantly above the ADEC cleanup criterion, thus, it is our opinion that such a bias does not affect the usability of the data.

RPDs associated with several metals analyzed in an internal laboratory duplicate failed to meet QC goals due to non-detectable concentrations of analytes in the original sample. No results have been qualified as a result of this QC failure.

Duplicates

Two duplicate soil samples were taken during the course of the 2007 field work. All analytes that were present in both samples exhibited a RPD less than the QC goal of 50%, with the exception of PCE detected in sample C3/6-10 and its associated duplicate. Failure to meet this QC goal indicates either a high degree of heterogeneity in the soils on site, or a relatively large variation in laboratory precision. As described above, the PCE concentrations were considerably

greater than the ADEC cleanup criterion, therefore, no sample results have been qualified as a result of this QC failure.

5.2 Groundwater Samples

Analysis was performed by Test America, an ADEC-approved laboratory, for the monitoring well groundwater sampling. Samples were hand-delivered to the laboratory by BGES personnel under chain of custody protocol. Coolers were delivered to the laboratory within the allowable temperature range of 4 degrees +/- 2 degrees Celsius. Samples contained the proper preservatives for the requested analyses and no unusual sample conditions were noted by the laboratory. Trip blanks accompanied the volatile samples (GRO and VOCs) through the entirety of the sampling process and delivery to the laboratory. None of the trip blanks associated with groundwater samples for this project contained detectable concentrations of contaminants of concern.

Work Order AQH0100

The case narrative associated with Work Orders Numbered AQH0100 (Test America, submitted August 22, 2007) noted that the CCV recovery was above the method control limit for n-hexane in the method blanks for VOCs; however, the analyte was not detected in the project samples. Therefore, it is our opinion that the data are not impacted and are acceptable for their intended use.

The RPD associated with samples analyzed as internal laboratory duplicates failed to meet QC goals due to non-detectable concentrations of analytes in the original sample. No results have been qualified as a result of this QC failure.

The RPD associated with a sample analyzed as an internal laboratory duplicate failed to meet QC goals for DRO. Associated samples MW-3 and MW-5 contained non-detectable concentrations of this analyte. Results have been qualified as estimates as a result of this QC failure.

Groundwater from Wells MW-3 and MW-5 was additionally analyzed for the following parameters: methane; ethane; ethene; nitrate/nitrite - nitrogen; dissolved sulfide; sulfate; iron; magnesium; acetic acid; butyric acid; formic acid; lactic acid; propionic acid; pyruvic acid; and carbon dioxide. These samples were forwarded to another laboratory from Test America. Samples designated for fatty acid analyses were sent to Severn Trent Laboratory in Buffalo, NY.

This laboratory provided a list of certifications that did not include the ADEC, and was not listed as a certified laboratory on the ADEC website. The use of an uncertified laboratory does not affect the usability of the data they generated for this project because samples sent to this laboratory were analyzed for parameters that will be used for remedial design, not to determine compliance with ADEC cleanup standards.

Work Order AQH0112

The case narrative associated with Work Orders Numbered AQH0112 (Test America, submitted August 22, 2007) noted that the CCV recovery was above the method control limit for n-hexane in the method blanks for VOCs; however, the analyte was not detected in the project samples. Therefore, it is our opinion that the data are not impacted and are acceptable for their intended use.

The RPD associated with a sample analyzed as an internal laboratory duplicate failed to meet QC goals for DRO and RRO. Associated samples MW-1, MW-2, MW-4, MW-6, and MW-7 contained non-detectable concentrations of this analyte. Results have been qualified as estimates as a result of this QC failure.

Work Order AQH0130

The case narrative associated with Work Order Number AQH0130 (Test America, submitted August 27, 2007) did not note any quality control issues, and none were noted in our QC review.

6.0 CONCEPTUAL SITE MODELS

Utilizing on site observations, historical information, and ADEC guidance documents, BGES has developed a graphical human health conceptual site model (CSM), included in Appendix G. An ecological conceptual site model was not prepared for this site for the reasons discussed below in Section 6.1.

The exact source of the PCE contamination is not known. Buried drums labeled as containing PCE were discovered just east of Monitoring Well MW-1 during the 1997 site characterization, but were found to be empty (EPMI, 1997). It is likely that the PCE contamination located on the subject property originated from improper dumping and disposal of solvents associated with the dry cleaning facility that operated from 1968 to 1970. According to various sources, PCE is reasonably anticipated to be a human carcinogen.

Soil contamination detected at the subject property during the 2007 sampling activities exceeding ADEC cleanup criteria consisted primarily of PCE, arsenic, and chromium, with a few detections of TCE that also exceeded the ADEC cleanup criterion. Several other metals and hydrocarbon compounds were also detected sporadically and at concentrations that did not exceed the ADEC cleanup criteria. In the past, a concentration of lead (996 ppm) was exhibited in one soil sample collected during a site characterization in 1997 from a depth of approximately 12 feet bg, which is very close to the commercial use cleanup criterion of 1,000 mg/Kg. . The origin of the lead contamination is unknown, but the sample was associated with a wood crib discovered south of the buried drums in the region of PCE contamination. The soil contamination essentially spans the entire soil column from near the ground surface to the water table at about 40 feet bg. Groundwater at the site has also been confirmed to contain concentrations of PCE that exceed the ADEC cleanup criterion. Iron has also been measured at a relatively high concentration, exceeding the secondary MCL for this substance. PCE concentrations in soils and groundwater exceed the ADEC cleanup criteria by up to five orders of magnitude.

The contaminants of concern may be transported by the uptake of plants, volatilization to outdoor or indoor air, deposition from fugitive dust, or migration through groundwater flow. Currently, humans (short or long-term workers, site visitors, or trespassers) or animals (invertebrates, plants, mammals, birds, etc.) may be exposed to the soil, groundwater, air, or biota (plants or animals) by ingestion, inhalation, or dermal contact. The CSM identifies complete and incomplete human exposure pathways to these contaminants of concern.

6.1 Ecological Conceptual Site Model

Following ADEC ecological scoping guidance, an ecological site model was deemed unnecessary because the contaminated area is located in downtown Anchorage and does not contain any wildlife habitats or valued species. The subject property is a gravel parking lot, thus no direct impacts to biota were observed on site. It is known that PCE does not bioaccumulate significantly in plants and animals.

Exposure pathways include near-surface soils, subsurface soils, and groundwater. The nearest wildlife habitat that could potentially support valued species is the northern wooded portion of a large lot, associated with the former location of the Alaska Native Medical Center, north of the subject property. The lot is owned by the Municipality of Anchorage and the wooded portion is located more than 500 feet to the north of the known contamination plume.

While the full extent of the groundwater contamination plume has not yet been delineated, the nearest body of surface water that could receive contaminated groundwater originating from this site is Ship Creek, which is located more than 1,500 feet to the north of the northern edge of the current known extent of the contamination. At this time, it is not known if the contamination originating at the subject property has migrated the considerable distance required to impact this body of surface water. However, recent work performed by CH2M Hill (Technical Memorandum titled "Review of Potential Sources of Contamination in the Vicinity of Groundwater Area of Interest GW 2/3, Anchorage Terminal Reserve", dated October 22, 2007) resulted in the following conclusion "...However, groundwater flow directions between [the subject property] and the Anchorage Terminal are not well characterized, so it is unknown if the site is hydraulically upgradient of the GW 2/3 area. The site groundwater monitoring data near the source area has also not shown the formation of breakdown products such as vinyl chloride...Based on the information reviewed, this site does not currently appear to be the source of the vinyl chloride in the GW 2/3 area."

In any event, Ship Creek is included as a potential future complete pathway by which contamination may eventually migrate to surface water, until this can be ruled out as a result of further characterization. Further evaluation of this pathway with regard to the contamination originating at the subject property has not been addressed at this time, rather, this pathway will be further evaluated if contamination is discovered to extend this considerable distance in the future. PCE has a low solubility in water, but it can remain in groundwater for a long time, and it quickly evaporates from surface water and will be commonly found as a vapor in the air if PCE contacts surface water. In addition, PCE may adhere to particles in water, and is denser than water, which will cause it to eventually settle to the bottom sediment or the base of an aquifer.

6.2 Human Health Conceptual Site Model

Subsurface soils and groundwater at the site have been impacted primarily by PCE contamination and, to a lesser extent, by TCE and lead. Furthermore, arsenic and chromium have been detected, although these concentrations are typical of background concentrations in the Anchorage area. The depth of the soils impacted by PCE has been further characterized during the 2007 shallow soil boring advancements. Analytical results from the shallow borings indicate that PCE concentrations above the ADEC cleanup criterion were exhibited in every sample from ground surface to 14 feet bg; results from the soil borings completed as monitoring wells from depths of 10 feet bg to 37 feet bg also indicated PCE concentrations above the ADEC

cleanup criterion in every sample submitted from these depths. Lead contamination was identified in only one sample collected at approximately 12 feet bg in 1997, but concentrations of lead were not detected in the water or soil samples above the ADEC cleanup criterion during the 2007 field work. The greatest PCE result encountered near the surface was 13.2 mg/Kg, collected from the north-central portion of the subject property, which exceeds the ADEC Method 2 migration to groundwater cleanup criterion (0.03 mg/Kg); however, the ADEC cleanup criterion for PCE for ingestion and inhalation are 160 mg/Kg and 80 mg/Kg, respectively, much higher than the greatest surface sample results. Ingestion and inhalation are still listed as potentially complete pathways, however, because it is possible that greater concentrations of PCE could be present in areas of the site that were not sampled.

The groundwater contamination consists of a dissolved phase product plume, the full extent of which has not yet been delineated. Historical data from the Phase II ESA performed by EPMI indicated that groundwater in the eastern portion of the property (Monitoring Wells EPM-1 and EPM2) was not impacted by PCE contamination, but recent groundwater samples collected during 2007 indicate that all wells exceeded the ADEC cleanup criteria for PCE, of which the greatest concentration was detected off site to the northeast. It should be noted, however, that Monitoring Wells EPM-1 and EPM-2 could not be located by BGES and therefore, have not been recently sampled.

Volatile constituents are present in both soils and groundwater. The depth to groundwater at the subject property is approximately 40 feet bg. A water well survey was conducted for the area within ¼ mile of the subject property. Five water supply wells were located in databases, but none of these wells could be located or verified to be in use. However, because of the potential for future use of groundwater in the vicinity of the subject property, ingestion of groundwater and inhalation of volatile organics from groundwater are currently considered complete exposure pathways.

Because the site functions as a parking lot, exposure to outdoor air is brief, with most site visitors remaining on the premises for just a few minutes, therefore the current risk from the compounds' volatilization is minimal.

Dermal contact and ingestion of impacted surface and subsurface soils is a current concern for construction workers, site visitors, or people developing the property. Contact with contaminated subsurface soils is minimal for current site visitors; however, subsurface soils are

impacted and because access to the site is uncontrolled, incidental ingestion and dermal contact of subsurface as well as surface soils is considered to be a complete pathway. PCE also evaporates less easily from the soil than from surface water, as it may adhere to particles and persist for a significant period of time. Furthermore, PCE requires an anaerobic environment for significant decomposition to occur.

Groundwater has been impacted but contact with contaminated groundwater is not possible for current site visitors; however, impacted groundwater does represent a potential future pathway that could impact future wells installed on the property. The nearest surface water is Ship Creek, located more than 1,500 feet to the north of the subject property; migration of impacted groundwater to surface waters is not likely because of the considerable distance, however, until this can be ruled out by further assessment, it is considered a potential complete exposure pathway. As previously discussed in Section 6.1, there are few opportunities for contaminants to be introduced into local biota: no stressed vegetation was observed, and no species that are commonly ingested by humans are present in the vicinity of the site.

7.0 CONCLUSIONS

Based on our findings of our Phase II ESA executed in 2004, and a request from the ADEC to further characterize and delineate the contamination at the subject property, five shallow soil borings were advanced to 15 feet bg in the western half of the subject property, and soil samples were collected from various depths. One new monitoring well was installed on site and two monitoring wells were installed off site and down-gradient of the subject property to further delineate the extent of soil and groundwater contamination. The new monitoring wells, as well as the existing monitoring wells, were sampled to evaluate groundwater quality trends. The monitoring wells were also re-surveyed because new wells were installed, and because modifications to the top of the well casings were necessary to close the protective casings during the 2004 activities. The property was formerly occupied by a variety of businesses, including C&K Cleaners (which may have been a drycleaners) from approximately 1968 through 1970, and NC Tire Center, which was the last occupant of the last building on site prior to being demolished.

During a Phase II ESA performed by EPMI in 1997, areas were identified as being impacted with PCE, including the former dry cleaning area located in the western portion property, as well as the former Tire Center, which was located in the eastern portion of the property. The PCE

concentration exhibited in the eastern portion of the property was 4.5 ppm (associated with the wood crib), which was collected from a depth of 12 feet bg, and the greatest concentration in the western portion of the property was 3.2 ppm collected from a depth of 7 feet bg. EPMI installed two groundwater monitoring wells in the eastern portion of the property in 1997 (EPM-1 and EPM-2), and one monitoring well in the northwestern portion of the property (MW-1).

A relatively small volume of soil exhibiting hydrocarbon concentrations exceeding the ADEC cleanup criteria was encountered during the removal of the hydraulic lifts and associated USTs during the Phase II ESA performed by BGES in 2004. Test pit excavations revealed numerous soil samples with PCE concentrations exceeding the ADEC cleanup criterion. A groundwater sample collected from Monitoring Well MW-1 exceeded the ADEC cleanup criterion for PCE by four orders of magnitude.

Five soil borings were advanced by using a truck-mounted drill rig and hollow-stem augers on May 15, 2007. Soil samples were collected from various locations from ground surface to approximately 15 feet bgs during the 2007 sampling activities. The soil samples were analyzed for GRO, DRO, VOCs, and RCRA metals. Furthermore, to aid in the design and monitoring of a potential remediation program, additional samples were collected from various depths from each soil boring, and were analyzed for TOC.

Concentrations of PCE were ubiquitous at the site, being exhibited in all of the shallow soil borings above the ADEC cleanup criterion, as listed in the table below. Concentrations of TCE also exceeded the ADEC cleanup criterion in the samples collected from Grid D in the north-central portion of the subject property. One of these samples, D5-12/14, exhibited the greatest concentration of PCE of any of the soil samples submitted for analysis. The greatest PCE result encountered near the surface was 13.2 mg/Kg, collected from the north-central portion of the subject property, which is a great deal less than the ADEC ingestion and inhalation cleanup criteria for PCE (160 mg/Kg and 80 mg/Kg, respectively), thus these concentrations detected in the shallow soils should not pose an immediate health concern to site visitors, especially given the short duration of expected visits based on the current site use as a parking lot. Concentrations of arsenic and chromium were detected in all of the shallow soil boring samples above the ADEC cleanup criteria, but they are believed to be within background concentration ranges typical of Alaskan soils. All other analytes were either detected below the ADEC cleanup criteria or below the laboratory's PQL. The table below lists the soil sample analysis results, by

depth and sample number, for VOC concentrations that are above the ADEC cleanup criteria.

SUMMARY OF SHALLOW SOIL BORING SOIL SAMPLE VOC CONCENTRATIONS EXCEEDING ADEC CLEANUP CRITERIA

Depth (feet bg)	GRID A (sample) (analysis result)	GRID C	GRID D	GRID E	GRID F
0 - 2	A1/0-2 1.54 mg/Kg PCE	C1/0-2 1.27 mg/Kg PCE	D1/0-2 10.4 mg/Kg PCE 0.0439 mg/Kg TCE	E1/0-2 1.35 mg/Kg PCE	F1/0-2 13.2 mg/Kg PCE
2 - 6	–	–	–	E2/2-6 0.359 mg/Kg PCE	–
6 - 10	–	C3/6-10 & G3/6-10 1.57 mg/Kg PCE 3.85 mg/Kg PCE	–	–	–
9 - 13	A4/9-13 49.5 mg/Kg PCE	–	–	–	–
10 - 14	–	–	–	–	F4/10-14 10.7 mg/Kg PCE
12 - 14	–	–	D5/12-14 821 mg/Kg PCE 0.0352 mg/Kg TCE	–	–

Additional soil borings, completed as monitoring wells, were advanced to the north of the subject property to evaluate the extent of contamination to the north which may have originated from the subject property, and in the southwest corner of the subject property to delineate the remaining extent of contamination to the southwest, and to evaluate if a potential off site source of contamination may be contributing to the contamination identified on the subject property through groundwater migration.

Soil boring 1 was advanced off site in the lot to the north of the subject property. Soil boring 2 was advanced off site in the lot to the north of the subject property, east of SB-1. Soil boring 3 was advanced in the southwest corner of the subject property. PCE was ubiquitous in the soil samples collected from the off site soil borings/monitoring wells, with concentrations in all of the soil samples exceeding the ADEC cleanup criterion. The table below lists the soil sample analysis results, by depth and sample number, for VOCs that exhibited concentrations that exceed the ADEC cleanup criteria for that analyte.

SUMMARY OF SOIL BORING/MONITORING WELL SOIL SAMPLE VOC CONCENTRATIONS EXCEEDING ADEC CLEANUP CRITERIA

Depth (feet bg)	Soil Boring 1 (MW-5) (Sample Number)	Soil Boring 2 (MW-6) (Sample Number)	Soil Boring 3 (MW-7) (Sample Number)
10 – 12		MW-6-10/12 0.908 mg/Kg PCE	
13 – 15			MW-7-15/17 1.99 mg/Kg PCE
15 - 17	MW-5-15/17 2.89 mg/Kg PCE		
20 – 22		MW-6-20/22 0.865 mg/Kg	
25 – 27	MW-5-25/27 2.40 mg/Kg PCE		MW-7-25/27 3.47 mg/Kg PCE
33 – 35		MW-6-33/35 2.38 mg/Kg	
35 – 37	MW-5-40/42 12.4 mg/Kg PCE		MW-7-35/37 & MW-7-40/42 (duplicate) 3.84 mg/Kg PCE 2.53 mg/Kg PCE

Concentrations of arsenic and chromium were also detected in all of the samples collected from the soil borings that were completed as monitoring wells, above the ADEC cleanup criteria, except for sample MW-5-15/17, which only detected arsenic above the ADEC cleanup criteria. These arsenic and chromium concentrations are believed to be within background concentration ranges typical of Alaskan soils. All other analytes were either detected below the ADEC cleanup criteria or below the laboratory's PQL.

Monitoring wells were installed in the three soil borings described above. Groundwater samples were collected from the four existing monitoring wells and the three newly installed wells. The samples were analyzed for GRO; DRO; RRO; VOCs; and RCRA metals. The groundwater flow direction at the site is to the northeast. All seven groundwater monitoring wells exhibited concentrations of PCE above the ADEC cleanup criterion. All other analytes were either detected below the ADEC cleanup criteria or below the laboratory's MRL. The greatest PCE concentration was detected in the newly installed Monitoring Well MW-6, which is located off site to the north and east of the subject property, at 0.822 mg/L.

In general, the monitoring wells that have had more than one round of sampling depict a general decline in the concentration of PCE, except for Monitoring Well MW-2, which has increased slightly.

MONITORING WELL PCE TREND

Sample Number Date Collected	PCE Results (mg/L)[1]
MW-1	
Oct-97	4.25
Apr-05	1.490
Aug-07	0.154
MW-2	
Apr-05	0.0707
Aug-07	0.115
MW-3	
Apr-05	1.790
Aug-07	0.338
MW-4	
Apr-05	0.372
Aug-07	0.0252

[1] = The ADEC cleanup criteria for PCE, based on 18AAC 75.345, Table C, Method 2, is 0.005 mg/L

Additional parameters were analyzed from both the soil and water samples to aid in the design and monitoring of a potential remediation program. Monitoring Wells MW-3 and MW-5 samples were additionally analyzed for the following parameters: methane; ethane; ethene; nitrate/nitrite-nitrogen; dissolved sulfide; sulfate; iron; magnesium; acetic acid; butyric acid; formic acid; lactic acid; propionic acid; pyruvic acid; and carbon dioxide.

The groundwater sample collected from Monitoring Well MW-3 exhibited a concentration of nitrates (nitrate-nitrogen) at 7.62 mg/L; sulfate at 30.7 mg/L; iron at 62.0 mg/L; magnesium at 47.7 mg/L; and carbon dioxide at 24 mg/L. The groundwater sample collected from Monitoring Well MW-5, exhibited concentrations of nitrates/nitrite - nitrogen at 6.68 mg/L; sulfates at 36.9 mg/L; iron at 136 mg/L; magnesium at 74.9 mg/L; and carbon dioxide at 36 mg/L. Acetic acid, butyric acid, formic acid, lactic acid, propionic acid, and pyruvic acid were not detectable above the PQL in either monitoring well. The samples collected from both monitoring wells did not contain detectable concentrations of methane, ethane, ethene, and dissolved sulfide above the respective MRLs. Although the ADEC does not have published cleanup criteria for these additional parameters, the drinking water MCLs listed for nitrate/nitrite – nitrogen, sulfate, and iron, as

listed in 18 AAC 80, are 10 mg/L, 250 mg/L, and 0.3 mg/L, respectively. The nitrate/nitrite – nitrogen and sulfate results for Monitoring Wells MW-3 and MW-5 were below the MCLs, whereas iron exceeded the MCL by 3 and 4 orders of magnitude, respectively.

To also aid in the design of a potential remediation program, various soil samples collected at various depths were analyzed for TOC. Five soil samples were collected from the shallow soil borings, and three soil samples were collected from the monitoring well soils during installation and analyzed for TOC. The results of the TOC analyses are summarized in the table below.

	TOC Analytical Results (mg/Kg)							
	Sample Number							
Depth	**A1/0-2**	**C2/2-6**	**D3/6-10**	**E4/10-14**	**F3/6-10**	**MW-5-30/32**	**MW-6-22.5/24.5**	**MW-7-32.5/34.5**
0 – 2	11,900							
2 - 6		2,520						
6-10			2,330		9,940			
10 - 14				9,960				
22.5 – 24.5							< 1,000	
30 – 32						< 1,000		
32.5 – 34.5								519,000

The additional water and soil quality parameters analyzed to aid in the design of a potential remedial program will be utilized at a later date, should active remediation be necessary.

The soil and water samples exhibited PCE concentrations that were several orders of magnitude greater than ADEC cleanup criterion during the 2004 sampling event and the 2007 sampling event. The lack of "daughter" (breakdown) constituents (TCE, DCE, and vinyl chloride) associated with PCE during the 2004 sampling event indicated that biodegradation of the contaminant was not occurring at a significant rate. This may be the case because of the generally coarse-grained nature of the soils, and the lack of an impervious surface covering (the gravel parking surface) which would allow oxygen to permeate to the subsurface; biodegradation of PCE typically occurs only under strictly anaerobic conditions, in the presence of a suitable electron donor. However, during the 2007 sampling event, TCE was detected in shallow soil

boring samples D1/0-2 (0 to 2 feet bg) at 0.0439, and sample D5/12-14 (12 to 14 feet bg) at 0.0352 mg/Kg, which was collected from the north-central portion of the property, indicating some measure of natural attenuation of the PCE contamination in this locale. The constituent TCE was not detected downgradient of these areas, as determined by the soil and water samples collected from the off site monitoring wells.

Upon receipt of the laboratory analytical results from the soil boring samples, drill cuttings that were contained in drums on site were disposed of as hazardous waste through Emerald Alaska. Ten drums were manifested on August 24, 2007 to transport to a hazardous waste facility in Beatty, Nevada, for processing (Appendix D).

Upon receipt of the laboratory analytical results for the groundwater samples, the purge water from sampling activities and wash water from the soil borings was also disposed of as hazardous waste through Emerald Alaska. One drum was manifested on September 14, 2007 to transport to a hazardous waste facility in Aragonite, Utah, for processing (Appendix D).

The horizontal extent of PCE contamination in soil and groundwater has not been defined in any direction both on and off site. Additional assessment, in the form of soil borings and monitoring wells, would be necessary to define the extent of this contamination. If active remediation is required for this site, the full extent of contamination should be defined prior to undertaking a remedial design. However, because the PCE concentration in most of the existing monitoring wells has declined by one order of magnitude since the previous round of groundwater monitoring, and since the newly installed monitoring wells have only been sampled once, it is recommended that the monitoring wells on and off the subject property be sampled on a semi-annual basis to monitor any seasonal trends in contaminant levels within the groundwater prior to making a determination as to the need for active remediation at this site. Furthermore, we recommend fixing the protective casings of Monitoring Wells MW-2 and MW-3, and resurveying the elevations after the TOC modifications. These wells had either bentonite flowing over the caps, or the PVC risers were cracked, allowing soil and bentonite to enter the wells. It is also recommended that three copies of this report be submitted to the ADEC for their review

8.0 EXCLUSIONS AND CONSIDERATIONS

This report presents facts, observations, and inferences based on conditions observed during the period of our project activities, and only those conditions that were evaluated as part of our scope

of work. Our conclusions are based solely on our observations made in the local vicinity of the additional site assessment borings and monitoring wells. In addition, changes to site conditions may have occurred since we completed our project activities. These changes may be from the actions of man or nature. Changes in regulations may also impact the interpretation of site conditions. BGES will not disclose our findings to any parties other than our client as listed above, and the ADEC, as requested by our client, except as directed by our client, or as required by law.

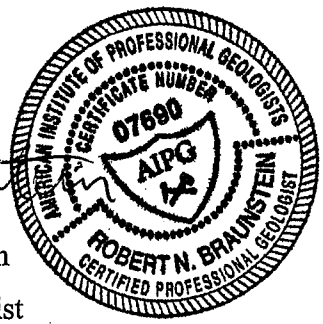
This report was prepared by Renee LaFata, Senior Environmental Scientist of BGES. Ms. LaFata has more than 10 years of experience and has conducted numerous site characterization and remediation efforts throughout Alaska, which included activities such as groundwater monitoring, excavation supervision and soil sampling, and the installation of monitoring wells. The report was reviewed by Robert N. Braunstein, Principal Geologist of BGES. Mr. Braunstein has more than 20 years of experience and has conducted and managed hundreds of environmental projects involving site characterization and remediation efforts, throughout Alaska and the lower 48 states.

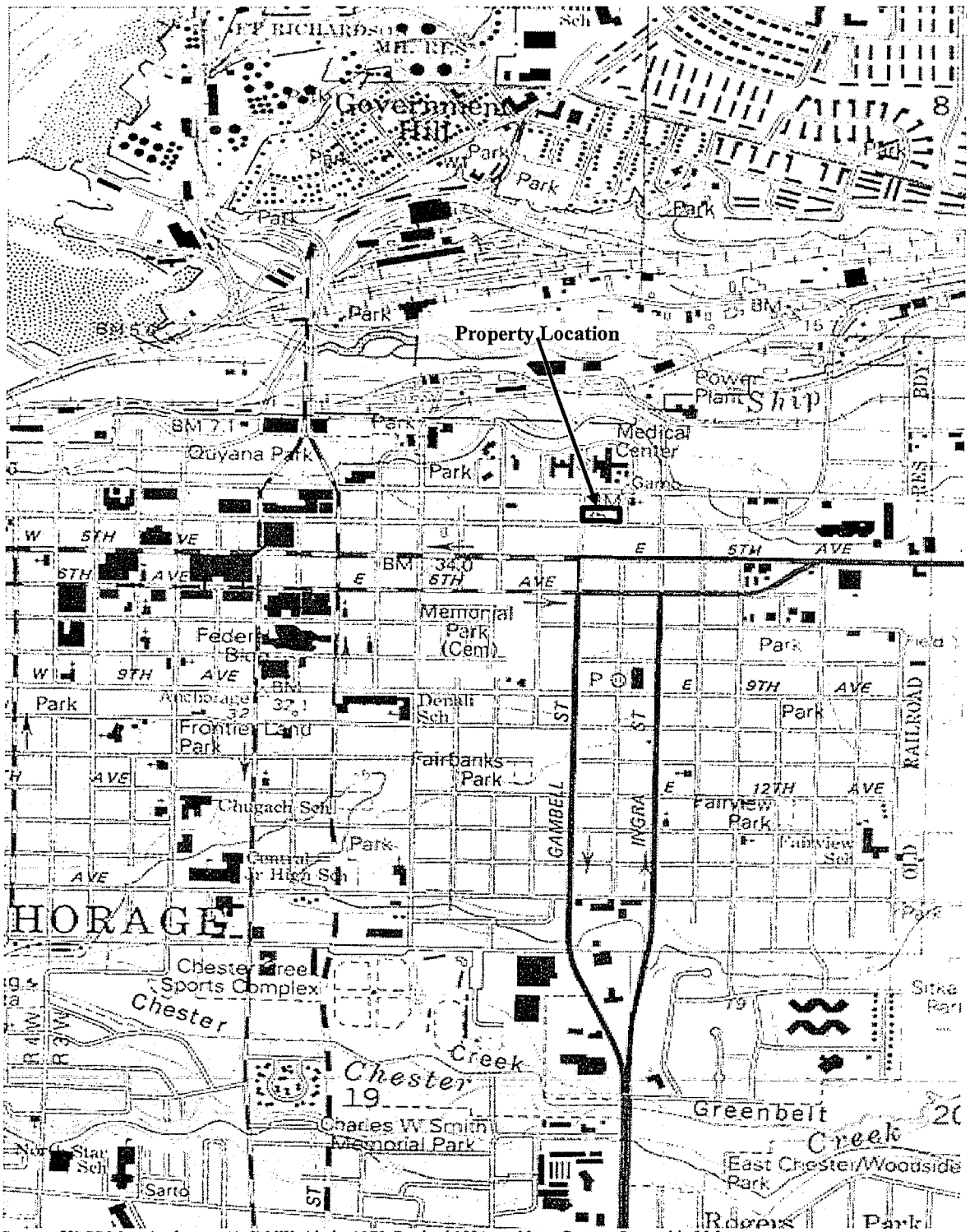
Prepared By:

Renee LaFata
Senior Environmental Scientist

Reviewed By:

Robert Braunstein
Principal Geologist





Source: USGS Map, Anchorage (A-8) NW, Alaska 1979, Revised 1994. Note: Contour Interval is 5 Meters

N

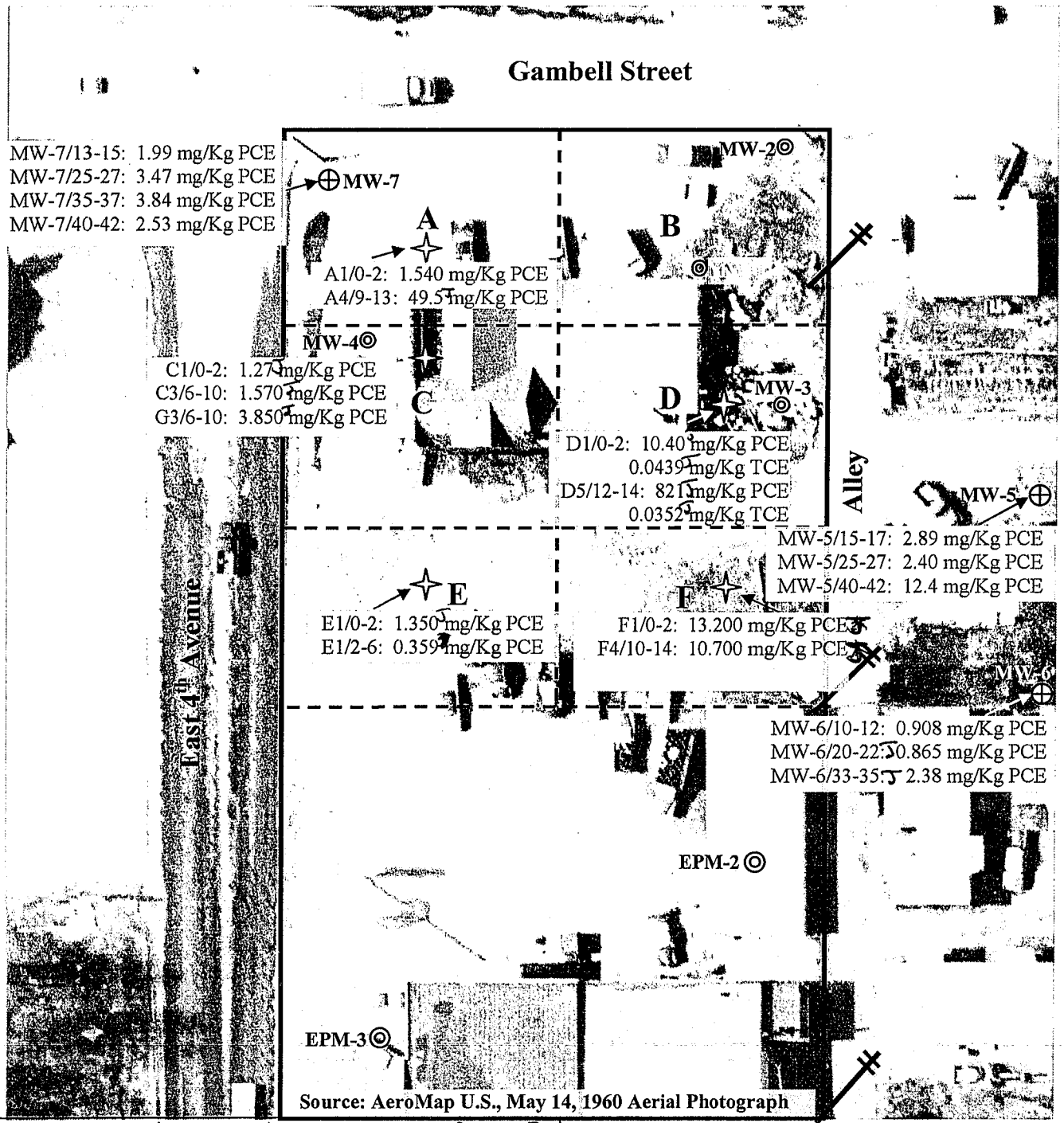
0 ¼ ½ ¾ 1

Approximate Scale in Miles

BGES

Lots 8A, 10, 11, 12; Block 26A East Addition
Fourth Avenue and Gambell Street, Anchorage, Alaska
PROPERTY VICINITY MAP

BGES, INC.	December 2007	Figure 1



Legend: J- estimated Result Biased Low

- ◎ = Existing Monitoring Well Location (Prior to 2007)
- ⊕ = Newly Installed Monitoring Well Location (2007) [Monitoring well soil sample numbers MW-7 (MW number) /13-15 (depth below grade (feet))]
- ✧ = Shallow Soil Boring Location [Sample No. E1/2-6, for example: E1 = Zone E, sample 1, depth sample collected is 2 to 6 feet below grade]
- [A] = Shallow Soil Sampling Zone

mg/Kg = milligrams per kilogram

PCE = tetrachloroethene; TCE = trichloroethene

Note: Sample analyses are listed only if they exceeded the ADEC cleanup criterion (excluding arsenic and chromium)

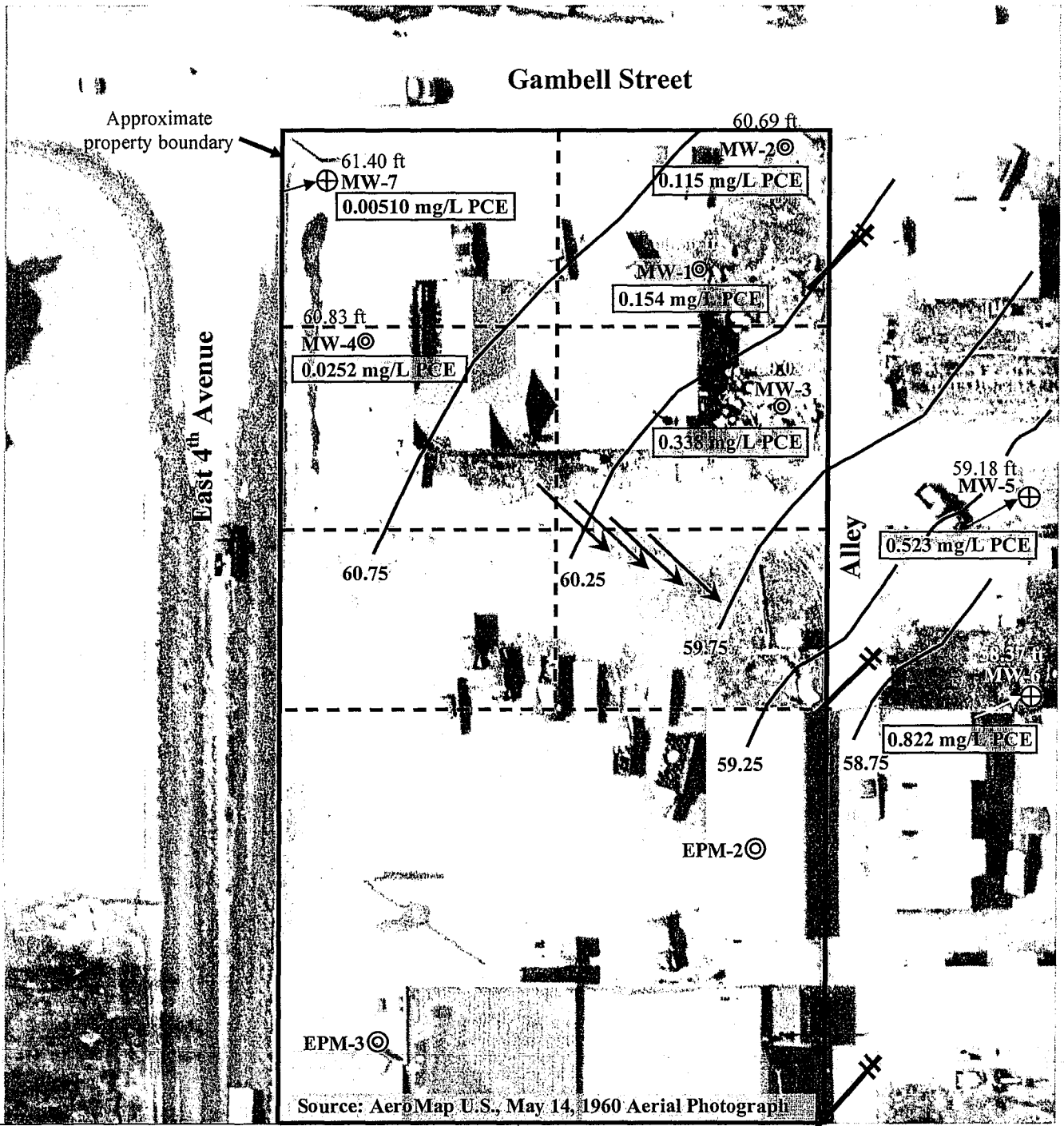
N

0 25 50 75 100

Lots 8A, 10, 11, 12; Block 26A East Addition
Fourth Avenue and Gambell Street, Anchorage, Alaska

SOIL SAMPLE LOCATIONS / EXCEEDANCES

BGES, INC.	December 2007	Figure 2



LEGEND

◎ = Existing Monitoring Well Location (Prior to 2007)
⊕ = Newly Installed Monitoring Well Location (2007)
mg/L = milligrams per liter; PCE = tetrachloroethene
→ = Approximate groundwater flow direction (measured on August 1, 2007)

Notes:
Groundwater elevations are listed above the Monitoring Well Number
Monitoring Wells EPM-2 and EPM-3 were last sampled October 1997 (PCE concentrations were below the method reporting limit).

N

0 25 50 75 100

Lots 8A, 10, 11, 12; Block 26A East Addition
Fourth Avenue and Gambell Street, Anchorage, Alaska

MONITORING WELL LOCATIONS / EXCEEDANCES AND GROUNDWATER FLOW

BGES, INC.	December 2007	Figure 3

TABLE 1 **BGES, INC.**

Fourth Avenue and Gambell Street

PID RESULTS

Grid Location	Screening Sample	Depth (feet below grade)	PID Reading (ppm) Spoon	PID Reading (ppm) Smpl	Analytical Sample No.
A	A1	0 - 2	0	0	A1/0-2 (+TOC)
	A2	2 - 5	0	0	
	A3-1	5 - 7	0	2	
	A3-2	7 - 9	0	1	
	A4-1	9 - 11	0	4	A4/9-13
	A4-2	11 -13	0	1	
	A5-1	13-15	0	1	
C	C1	0 - 2	0	2	C1/0-2
	C2-1	2 - 4	0	0	C2/2-6 TOC
	C2-2	4 - 6	0	0	
	C3-1	6 - 8	0	2	C3/6-10[1]
	C3-2	8 - 10	0	12	
	C4-1	10 - 12	0	0	
	C4-2	12 - 14	0	1	
D	D1	0 - 2	0	12	D1/0-2
	D2-1	2 - 4	0	18	
	D2-2	4 - 6	0	12	
	D3-1	6 - 8	0	1	D3/6-10 TOC
	D3-2	8 - 10	0	3	
	D4-1	10 - 12	0	2	
	D4-2	12 - 14	16	46	D5/12-14
E	E1	0 - 2	0	1	E1/0-2
	E2-1	2 - 4	0	0	E2/2-6
	E2-2	4 - 6	0	0	
	E3-1	6 - 8	0	0	
	E3-2	8 - 10	0	0	
	E4-1	10 - 12	0	0	E4/10-14 TOC
	E4-2	12 - 14	0	1	
F	F1	0 - 2	0	4	F1/0-2
	F2-1	2 - 4	0	2	
	F2-2	4 - 6	0	1	
	F3-1	6 - 8	0	0	F3/6-10 TOC
	F3-2	8 - 10	0	2	
	F4-1	10 - 12	0	2	F4/10-14
	F4-2	12 - 14	0	6	

[1] = G3/6-10 is a duplicate of C3/6-10

PID = Photoionization Detector (BW Gas Alert Micro 5)

PID reading is in parts per million (ppm)

Headspace screening samples collected on July 23, 2007

TABLE 2
Fourth Avenue and Gambell Street
ANALYTICAL RESULTS - SOILS

Soil Sample No. / Sample Depth	Parameter	Results (mg/Kg)	PQL (mg/Kg)	ADEC Soil Cleanup level (mg/Kg)	Analytical Method
SHALLOW SOIL BORINGS					
A1/0-2	GRO	ND	1.70	300[1]	AK101
	DRO	ND	84.2	250[1]	AK102
0 - 2 feet bg	RRO	183	84.2	10,000[1]	AK103
PID = 0 ppm	Mercury	ND	0.0420	1.4[2]	SW7471A
	Arsenic	**4.83**	1.07	2[2]	SW6020
	Barium	62.2	0.321	1,100[2]	SW6020
	Cadmium	0.316	0.214	5[2]	SW6020
	Chromium	**39.2**	0.428	26[2]	SW6020
	Lead	10.2	0.214	400[2]	SW6020
	Selenium	ND	0.535	3.5[2]	SW6020
	Silver	ND	0.107	21[2]	SW6020
	PCE	**1.540 J**	0.0170	0.03[2]	SW8260
	All Other VOCs	ND	varies	varies[2]	SW8260
A4/9-13	GRO	1.95 J	1.15	300[1]	AK101
	DRO	ND	20.4	250[1]	AK102
9-13 feet bg	RRO	ND	20.4	10,000[1]	AK103
PID = 4 ppm	Mercury	ND	0.0406	1.4[2]	SW7471A
	Arsenic	**4.75**	1.03	2[2]	SW6020
	Barium	38.3	0.308	1,100[2]	SW6020
	Cadmium	ND	0.205	5[2]	SW6020
	Chromium	**27.1**	0.411	26[2]	SW6020
	Lead	3.97	0.205	400[2]	SW6020
	Selenium	ND	0.513	3.5[2]	SW6020
	Silver	ND	0.103	21[2]	SW6020
	PCE	**49.500 J***	1.150	0.03[2]	SW8260
	All Other VOCs	ND	varies	varies[2]	SW8260
C1/0-2	GRO	ND	1.46	300[1]	AK101
	DRO	ND	85.0	250[1]	AK102
0 - 2 feet bg	RRO	332	85.0	10,000[1]	AK103
PID = 2 ppm	Mercury	0.0737	0.0422	1.4[2]	SW7471A
	Arsenic	**6.85**	1.05	2[2]	SW6020
	Barium	78.9	0.314	1,100[2]	SW6020
	Cadmium	0.690	0.209	5[2]	SW6020
	Chromium	**37.3**	0.418	26[2]	SW6020
	Lead	37.8	0.209	400[2]	SW6020
	Selenium	0.630	0.523	3.5[2]	SW6020
	Silver	0.111	0.105	21[2]	SW6020
	PCE	**1.27J***	0.0146	0.03[2]	SW8260
	All Other VOCs	ND	varies	varies[2]	SW8260

[1] Soil criteria from Alaska Department of Environmental Conservation (ADEC) 18AAC 75.341, Table B2;[2] Soil criteria from ADEC, 18AAC 75.341, Table B1.

* estimated Result

Bold results = Concentration exceeds corresponding ADEC cleanup criterion

bg = below grade; GRO = gasoline range organics; J = estimated value below reporting limit; mg/Kg = milligrams per kilogram
MRL = method reporting limit; ND = non-detectable; below the MRL or PQL; PQL = practical quantitation limit;
DRO = diesel range organics; RRO = residual range organics; PCE= tetrachloroethylene

TABLE 2
Fourth Avenue and Gambell Street
ANALYTICAL RESULTS - SOILS

Soil Sample No. / Sample Depth	Parameter	Results (mg/Kg)	PQL (mg/Kg)	ADEC Soil Cleanup level (mg/Kg)	Analytical Method
SHALLOW SOIL BORINGS					
C3/6-10	GRO	0.989 J	1.13	300[1]	AK101
	DRO	3.59 J	20.4	250[1]	AK102
6 - 10 feet bg	RRO	16.6 J	20.4	10,000[1]	AK103
PID = 12 ppm	Mercury	0.0535	0.0403	1.4[2]	SW7471A
	Arsenic	**5.70**	0.989	2[2]	SW6020
	Barium	40.2	0.297	1,100[2]	SW6020
	Cadmium	0.290	0.198	5[2]	SW6020
	Chromium	**33.3**	0.396	26[2]	SW6020
	Lead	4.90	0.198	400[2]	SW6020
	Selenium	0.433 J	0.494	3.5[2]	SW6020
	Silver	0.0830 J	0.0989	21[2]	SW6020
	PCE	**1.570 J** *	0.113	0.03[2]	SW8260
	All Other VOCs	ND	varies	varies[2]	SW8260
G3/6-10	GRO	1.06 J	1.29	300[1]	AK101
Duplicate of C3/6-10	DRO	2.22 J	20.8	250[1]	AK102
	RRO	22.0	20.8	10,000[1]	AK103
	Mercury	0.0435	0.0415	1.4[2]	SW7471A
	Arsenic	**6.19**	1.02	2[2]	SW6020
	Barium	42.0	0.305	1,100[2]	SW6020
	Cadmium	0.284	0.203	5[2]	SW6020
	Chromium	**35.8**	0.407	26[2]	SW6020
	Lead	5.31	0.203	400[2]	SW6020
	Selenium	0.362 J	0.509	3.5[2]	SW6020
	Silver	0.0827 J	0.102	21[2]	SW6020
	PCE	**3.850 J** *	1.290	0.03[2]	SW8260
	All Other VOCs	ND	varies	varies[2]	SW8260
D1/0-2	GRO	2.44 J	1.42	300[1]	AK101
	DRO	38.8 J	84.3	250[1]	AK102
0 - 2 feet bg	RRO	208	84.3	10,000[1]	AK103
PID = 12 ppm	Mercury	0.0437	0.0419	1.4[2]	SW7471A
	Arsenic	**7.05**	1.04	2[2]	SW6020
	Barium	75.7	0.311	1,100[2]	SW6020
	Cadmium	0.436	0.208	5[2]	SW6020
	Chromium	**35.4**	0.415	26[2]	SW6020
	Lead	28.2	0.208	400[2]	SW6020
	Selenium	0.409 J	0.519	3.5[2]	SW6020
	Silver	0.0821 J	0.104	21[2]	SW6020
	PCE	**10.400 J** *	1.420	0.03[2]	SW8260
	TCE	**0.0439 J** *	0.0142	0.027[2]	SW8260
	All Other VOCs	ND	varies	varies[2]	SW8260

[1] Soil criteria from Alaska Department of Environmental Conservation (ADEC) 18AAC 75.341, Table B2; [2] Soil criteria from ADEC, 18AAC 75.341, Table B1.

* estimated Result

Bold results = Concentration exceeds corresponding ADEC cleanup criterion

bg = below grade; GRO = gasoline range organics; J = estimated value below reporting limit; mg/Kg = milligrams per kilogram
MRL = method reporting limit; ND = non-detectable; below the MRL or PQL; PQL = practical quantitation limit;
DRO = diesel range organics; RRO = residual range organics; PCE= tetrachloroethylene; TCE = trichloroethene

TABLE 2
Fourth Avenue and Gambell Street
ANALYTICAL RESULTS - SOILS

Soil Sample No. / Sample Depth	Parameter	Results (mg/Kg)	PQL (mg/Kg)	ADEC Soil Cleanup level (mg/Kg)	Analytical Method
SHALLOW SOIL BORINGS					
D5/12-14	GRO	9.70	1.45	300[1]	AK101
	DRO	88.3	20.7	250[1]	AK102
12 - 14 feet bg	RRO	82.7	20.7	10,000[1]	AK103
PID = 46 ppm	Mercury	0.0532	0.0410	1.4[2]	SW7471A
	Arsenic	**4.56**	1.02	2[2]	SW6020
	Barium	48.7	0.306	1,100[2]	SW6020
	Cadmium	0.263	0.204	5[2]	SW6020
	Chromium	**31.4**	0.408	26[2]	SW6020
	Lead	4.44	0.204	400[2]	SW6020
	Selenium	0.401 J	0.510	3.5[2]	SW6020
	Silver	0.0618 J	0.102	21[2]	SW6020
	PCE	**821.000 J**	145.000	0.03[2]	SW8260
	TCE	**0.0352 J** *	0.0145	0.027[2]	SW8260
	Toluene	9.120 J	29.000	5.5	SW8260
	P&M XyleneS	9.120 J	29.000	78	SW8260
	All Other VOCs	ND	varies	varies[2]	SW8260
E1/0-2	GRO	ND	1.76	300[1]	AK101
	DRO	ND	89.6	250[1]	AK102
0 - 2 feet bg	RRO	496	89.6	10,000[1]	AK103
PID = 1 ppm	Mercury	0.0812	0.0446	1.4[2]	SW7471A
	Arsenic	**7.02**	1.11	2[2]	SW6020
	Barium	105	0.333	1,100[2]	SW6020
	Cadmium	0.857	0.222	5[2]	SW6020
	Chromium	**33.2**	0.444	26[2]	SW6020
	Lead	70.6	0.222	400[2]	SW6020
	Selenium	0.574	0.554	3.5[2]	SW6020
	Silver	0.441	0.111	21[2]	SW6020
	PCE	**1.350 J** *	0.0176	0.03[2]	SW8260
	All Other VOCs	ND	varies	varies	SW8260
E2/2-6	GRO	ND	1.07	300[1]	AK101
	DRO	ND	20.4	250[1]	AK102
2 - 6 feet bg	RRO	47.0	20.4	10,000[1]	AK103
PID = 0 ppm	Mercury	0.0433	0.0408	1.4[2]	SW7471A
	Arsenic	**7.12**	1.01	2[2]	SW6020
	Barium	54.1	0.303	1,100[2]	SW6020
	Cadmium	0.346	0.202	5[2]	SW6020
	Chromium	**37.1**	0.404	26[2]	SW6020
	Lead	6.48	0.202	400[2]	SW6020
	Selenium	ND	0.505	3.5[2]	SW6020
	Silver	ND	0.101	21[2]	SW6020
	PCE	**0.359 J**	0.0107	0.03[2]	SW8260
	All Other VOCs	ND	varies	varies	SW8260

[1] Soil criteria from Alaska Department of Environmental Conservation (ADEC) 18AAC 75.341, Table B2; [2] Soil criteria from ADEC, 18AAC 75.341, Table B1.

Bold results = Concentration exceeds corresponding ADEC cleanup criterion

bg = below grade; GRO = gasoline range organics; J = estimated ~~value below reporting limit~~; mg/Kg = milligrams per kilogram

MRL = method reporting limit; ND = non-detectable; below the MRL or PQL; PQL = practical quantitation limit;

DRO = diesel range organics; RRO = residual range organics; PCE= tetrachloroethylene; TCE = trichloroethene

* J - estimated Result (did not meet holding time)

TABLE 2
Fourth Avenue and Gambell Street
ANALYTICAL RESULTS - SOILS

Soil Sample No. / Sample Depth	Parameter	Results (mg/Kg)	PQL (mg/Kg)	ADEC Soil Cleanup level (mg/Kg)	Analytical Method
SHALLOW SOIL BORINGS					
F1/0-2	GRO	1.65 J	1.6	300[1]	AK101
	DRO	337 J	962	250[1]	AK102
0 - 2 feet bg	RRO	4,360	962	10,000[1]	AK103
PID = 4 ppm	Mercury	0.0614	0.0454	1.4[2]	SW7471A
	Arsenic	**9.08**	1.14	2[2]	SW6020
	Barium	109	0.343	1,100[2]	SW6020
	Cadmium	0.531	0.228	5[2]	SW6020
	Chromium	**29.9**	0.457	26[2]	SW6020
	Lead	32.7	0.228	400[2]	SW6020
	Selenium	1.05	0.571	3.5[2]	SW6020
	Silver	0.195	0.114	21[2]	SW6020
	PCE	**13.200 J***	1.600	0.03[2]	SW8260
	All Other	ND	varies	varies	SW8260
F4/10-14	GRO	2.27 J	1.23	300[1]	AK101
	DRO	2.73 J	20.3	250[1]	AK102
10 - 14 feet bg	RRO	20.5	20.3	10,000[1]	AK103
PID = 6 ppm	Mercury	0.102	0.0405	1.4[2]	SW7471A
	Arsenic	**5.09**	1.01	2[2]	SW6020
	Barium	40.7	0.302	1,100[2]	SW6020
	Cadmium	0.223	0.201	5[2]	SW6020
	Chromium	**30.8**	0.402	26[2]	SW6020
	Lead	4.21	0.201	400[2]	SW6020
	Selenium	0.254 J	0.503	3.5[2]	SW6020
	Silver	0.0514 J	0.101	21[2]	SW6020
	PCE	**10.700 J***	1.230	0.03[2]	SW8260
	TCE	0.00910 J*	0.0123	0.027[2]	SW8260
	All Other VOCs	ND	varies	varies	SW8260

[1] Soil criteria from Alaska Department of Environmental Conservation (ADEC) 18AAC 75.341, Table B2; [2] Soil criteria from ADEC, 18AAC 75.341, Table B1.

Bold results = Concentration exceeds corresponding ADEC cleanup criterion * estimated Result

bg = below grade; GRO = gasoline range organics; J = estimated value below reporting limit; mg/Kg = milligrams per kilogram
MRL = method reporting limit; ND = non-detectable; below the MRL or PQL; PQL = practical quantitation limit;
DRO = diesel range organics; RRO = residual range organics; PCE= tetrachloroethylene; TCE = trichloroethene

TABLE 2
Fourth Avenue and Gambell Street
ANALYTICAL RESULTS - SOILS

Soil Sample No. / Sample Depth	Parameter	Results (mg/Kg)	PQL (mg/Kg)	ADEC Soil Cleanup level (mg/Kg)	Analytical Method
SOIL BORINGS (MONITORING WELLS)					
MW-5-15/17	GRO	ND	2.83	300[1]	AK101
	DRO	ND	20.0	250[1]	AK 102
15 - 17 feet bg	RRO	ND	50.0	10,000[1]	AK 103
PID = 2 ppm	Mercury	ND	0.104	1.4[2]	SW7471A
	Arsenic	**3.37**	0.566	2[2]	EPA 6000/7000
	Barium	72.1	5.66	1,100[2]	EPA 6000/7001
	Cadmium	ND	0.566	5[2]	EPA 6000/7002
	Chromium	23.7	0.566	26[2]	EPA 6000/7003
	Lead	3.20	0.566	400[2]	EPA 6000/7004
	Selenium	ND	0.566	3.5[2]	EPA 6000/7005
	Silver	0.816	0.566	21[2]	EPA 6000/7006
	PCE	**2.89**	0.0308	0.03[2]	SW8260B
	All Other VOCs	ND	varies	varies[2]	SW8260B
MW-5-25/27	GRO	ND	2.41	300[1]	AK101
	DRO	ND	20.0	250[1]	AK102/103
25 - 27 feet bg	RRO	ND	50.0	10,000[1]	AK102/103
PID = 2 ppm	Mercury	ND	0.103	1.4[2]	SW7471A
	Arsenic	**4.47**	0.473	2[2]	EPA 6000/7000
	Barium	34.3	4.73	1,100[2]	EPA 6000/7001
	Cadmium	ND	0.473	5[2]	EPA 6000/7002
	Chromium	**28.8**	0.473	26[2]	EPA 6000/7003
	Lead	3.75	0.473	400[2]	EPA 6000/7004
	Selenium	ND	0.473	3.5[2]	EPA 6000/7005
	Silver	ND	0.473	21[2]	EPA 6000/7006
	PCE	**2.40**	0.0203	0.03[2]	SW8260B
	All Other VOCs	ND	varies	varies[2]	SW8260B
MW-5-40/42	GRO	3.58	2.69	300[1]	AK101
	DRO	ND	20.0	250[1]	AK 102
40 - 42 feet bg	RRO	ND	50.0	10,000[1]	AK 103
PID = 14 ppm	Mercury	ND	0.105	1.4[2]	SW7471A
	Arsenic	**3.68**	0.454	2[2]	EPA 6000/7000
	Barium	47.2	4.54	1,100[2]	EPA 6000/7001
	Cadmium	ND	0.454	5[2]	EPA 6000/7002
	Chromium	**31.0**	0.454	26[2]	EPA 6000/7003
	Lead	3.50	0.454	400[2]	EPA 6000/7004
	Selenium	ND	0.454	3.5[2]	EPA 6000/7005
	Silver	ND	0.454	21[2]	EPA 6000/7006
	PCE	**12.4**	0.953	0.03[2]	SW8260B
	All Other VOCs	ND	varies	varies[2]	SW8260B

[1] Soil criteria from Alaska Department of Environmental Conservation (ADEC) 18AAC 75.341, Table B2;[2] Soil criteria from ADEC, 18AAC 75.341, Table B1.

Bold results = Concentration exceeds corresponding ADEC cleanup criterion

bg = below grade; GRO = gasoline range organics; J = estimated value below reporting limit; mg/Kg = milligrams per kilogram
MRL = method reporting limit; ND = non-detectable; below the MRL or PQL; PQL = practical quantitation limit;
DRO = diesel range organics; RRO = residual range organics; PCE= tetrachloroethylene

TABLE 2
Fourth Avenue and Gambell Street
ANALYTICAL RESULTS - SOILS

Soil Sample No. / Sample Depth	Parameter	Results (mg/Kg)	PQL (mg/Kg)	ADEC Soil Cleanup level (mg/Kg)	Analytical Method
SOIL BORINGS (MONITORING WELLS)					
MW-6-10/12	GRO	UJ	2.72	300[1]	AK101
	DRO	ND	20.0	250[1]	AK 102
10 - 12 feet bg	RRO	ND	50.0	10,000[1]	AK 103
PID = 2 ppm	Mercury	ND	0.0962	1.4[2]	SW7471A
	Arsenic	**4.61**	0.486	2[2]	EPA 6000/7000
	Barium	43.5	4.86	1,100[2]	EPA 6000/7001
	Cadmium	ND	0.486	5[2]	EPA 6000/7002
	Chromium	**31.5**	0.486	26[2]	EPA 6000/7003
	Lead	4.78	0.486	400[2]	EPA 6000/7004
	Selenium	ND	0.486	3.5[2]	EPA 6000/7005
	Silver	ND	0.486	21[2]	EPA 6000/7006
	PCE	**0.908**	0.00797	0.03[2]	SW8260B
	All Other VOCs	ND	varies	varies[2]	SW8260B
MW-6-20/22	GRO	UJ	2.31	300[1]	AK101
	DRO	ND	20.0	250[1]	AK 102
20 - 22 feet bg	RRO	ND	50.0	10,000[1]	AK 103
PID = 2 ppm	Mercury	ND	0.0974	1.4[2]	SW7471A
	Arsenic	**4.45**	0.468	2[2]	EPA 6000/7000
	Barium	29.1	4.68	1,100[2]	EPA 6000/7001
	Cadmium	ND	0.468	5[2]	EPA 6000/7002
	Chromium	**33.7**	0.468	26[2]	EPA 6000/7003
	Lead	3.78	0.468	400[2]	EPA 6000/7004
	Selenium	ND	0.468	3.5[2]	EPA 6000/7005
	Silver	ND	0.468	21[2]	EPA 6000/7006
	PCE	**0.865 J***	0.00792	0.03[2]	SW8260B
	All Other VOCs	ND	varies	varies[2]	SW8260B
MW-6-33/35	GRO	UJ	2.58	300[1]	AK101
	DRO	ND	20.0	250[1]	AK 102
33 - 35 feet bg	RRO	ND	50.0	10,000[1]	AK 103
PID = 6 ppm	Mercury	ND	0.0948	1.4[2]	SW7471A
	Arsenic	**3.76**	0.487	2[2]	EPA 6000/7000
	Barium	41.7	4.87	1,100[2]	EPA 6000/7001
	Cadmium	ND	0.487	5[2]	EPA 6000/7002
	Chromium	**33.5**	0.487	26[2]	EPA 6000/7003
	Lead	3.29	0.487	400[2]	EPA 6000/7004
	Selenium	ND	0.487	3.5[2]	EPA 6000/7005
	Silver	ND	0.487	21[2]	EPA 6000/7006
	PCE	**2.38 J***	0.0286	0.03[2]	SW8260B
	All Other VOCs	ND	varies	varies[2]	SW8260B

[1] Soil criteria from Alaska Department of Environmental Conservation (ADEC) 18AAC 75.341, Table B2; [2] Soil criteria from ADEC, 18AAC 75.341, Table B1.

Bold results = Concentration exceeds corresponding ADEC cleanup criterion ; * biased high (estimated value)

bg = below grade; J = estimated value below reporting limit; mg/Kg = milligrams per kilogram; MRL = method reporting limit; ND = non-detectable; below the MRL or PQL; PQL = practical quantitation limit; UJ = results estimated below the MRL

DRO = diesel range organics; GRO = gasoline range organics; RRO = residual range organics; PCE= tetrachloroethylene

TABLE 2
Fourth Avenue and Gambell Street
ANALYTICAL RESULTS - SOILS

Soil Sample No. / Sample Depth	Parameter	Results (mg/Kg)	PQL (mg/Kg)	ADEC Soil Cleanup level (mg/Kg)	Analytical Method
SOIL BORINGS (MONITORING WELLS)					
MW-7-15/17	GRO	ND	1.84	300[1]	AK101
	DRO	ND	20.0	250[1]	AK 102
15 - 17 feet bg	RRO	ND	50.0	10,000[1]	AK 103
PID = 0 ppm	Mercury	ND	0.0940	1.4[2]	SW7471A
	Arsenic	**4.02**	0.530	2[2]	EPA 6000/7000
	Barium	35.3	5.30	1,100[2]	EPA 6000/7001
	Cadmium	ND	0.530	5[2]	EPA 6000/7000
	Chromium	**28.0**	0.530	26[2]	EPA 6000/7003
	Lead	3.13	0.418	400[2]	EPA 6000/7004
	Selenium	ND	0.530	3.5[2]	EPA 6000/7005
	Silver	ND	0.530	21[2]	EPA 6000/7006
	PCE	**1.99 J**	0.0235	0.03[2]	SW8260B
	All Other VOCs	ND	varies	varies[2]	SW8260B
MW-7-25/27	GRO	ND	2.13	300[1]	AK101
	DRO	ND	20.0	250[1]	AK 102
25 - 27 feet bg	RRO	ND	50.0	10,000[1]	AK 103
PID = 0 ppm	Mercury	ND	0.103	1.4[2]	SW7471A
	Arsenic	**3.90**	0.520	2[2]	EPA 6000/7000
	Barium	48.4	5.20	1,100[2]	EPA 6000/7000
	Cadmium	ND	0.520	5[2]	EPA 6000/7000
	Chromium	**32.8**	0.520	26[2]	EPA 6000/7002
	Lead	2.80	0.423	400[2]	EPA 6000/7003
	Selenium	ND	0.520	3.5[2]	EPA 6000/7004
	Silver	ND	0.520	21[2]	EPA 6000/7005
	PCE	**3.47 J**	0.0282	0.03[2]	EPA 6000/7006
	All Other VOCs	ND	varies	varies[2]	SW8260B
MW-7-35/37	GRO	ND	2.22	300[1]	AK101
	DRO	ND	20.0	250[1]	AK 102
35 - 37 feet bg	RRO	ND	50.0	10,000[1]	AK 103
PID = 2 ppm	Mercury	ND	0.1030	1.4[2]	SW7471A
	Arsenic	**4.52**	0.610	2[2]	EPA 6000/7000
	Barium	50.2	6.10	1,100[2]	EPA 6000/7000
	Cadmium	ND	0.610	5[2]	EPA 6000/7000
	Chromium	**34.0**	0.610	26[2]	EPA 6000/7002
	Lead	4.15	0.610	400[2]	EPA 6000/7003
	Selenium	ND	0.610	3.5[2]	EPA 6000/7004
	Silver	ND	0.610	21[2]	EPA 6000/7005
	PCE	**3.84 J**	0.0700	0.03[2]	EPA 6000/7006
	All Other VOCs	ND	varies	varies[2]	SW8260B

[1] Soil criteria from Alaska Department of Environmental Conservation (ADEC) 18AAC 75.341, Table B2; [2] Soil criteria from ADEC, 18AAC 75.341, Table B1.

Bold results = Concentration exceeds corresponding ADEC cleanup criterion

bg = below grade; GRO = gasoline range organics; J = estimated value below reporting limit; mg/Kg = milligrams per kilogram
MRL = method reporting limit; ND = non-detectable; below the MRL or PQL; PQL = practical quantitation limit;
DRO = diesel range organics; RRO = residual range organics; PCE= tetrachloroethylene

TABLE 2
Fourth Avenue and Gambell Street
ANALYTICAL RESULTS - SOILS

Soil Sample No. / Sample Depth	Parameter	Results (mg/Kg)	PQL (mg/Kg)	ADEC Soil Cleanup level (mg/Kg)	Analytical Method
SOIL BORINGS (MONITORING WELLS)					
MW-7-40/42	GRO	ND	2.48	300[1]	AK101
duplicate of MW-7-35/37	DRO	ND	17.4	250[1]	AK 102
	RRO	ND	43.4	10,000[1]	AK 103
	Mercury	ND	0.0994	1.4[2]	SW7471A
	Arsenic	**4.04**	0.512	2[2]	EPA 6000/7000
	Barium	43.1	5.12	1,100[2]	EPA 6000/7000
	Cadmium	ND	0.512	5[2]	EPA 6000/7000
	Chromium	**27.8**	0.512	26[2]	EPA 6000/7002
	Lead	3.60	0.483	400[2]	EPA 6000/7003
	Selenium	ND	0.512	3.5[2]	EPA 6000/7004
	Silver	ND	0.512	21[2]	EPA 6000/7005
	PCE	**2.53 J**	0.00262	0.03[2]	EPA 6000/7006
	All Other VOCs	ND	varies	varies[2]	SW8260B

[1] Soil criteria from Alaska Department of Environmental Conservation (ADEC) 18AAC 75.341, Table B2;[2] Soil criteria from ADEC, 18AAC 75.341, Table B1.

Bold results = Concentration exceeds corresponding ADEC cleanup criterion

bg = below grade; GRO = gasoline range organics; J = estimated value below reporting limit; mg/Kg = milligrams per kilogram
MRL = method reporting limit; ND = non-detectable; below the MRL or PQL; PQL = practical quantitation limit;
DRO = diesel range organics; RRO = residual range organics; PCE= tetrachloroethylene

TABLE 3
Fourth Avenue and Gambell Street
ANALYTICAL RESULTS - GROUNDWATER

Sample No.	Parameter	Results (mg/L)	MRL (mg/L)	ADEC Cleanup Criteria (mg/L)[1]	Analytical Method
MW-1	RRO	UJ	0.407	1.1	AK103
	DRO	UJ	0.407	1.5	AK 102
	GRO	0.0705	0.0500	1.3	AK 101
	PCE	**0.154**	0.00400	0.005	8260B
	VOCs (all others)	ND	Varies	Varies	8260B
MW-2	RRO	UJ	0.424	1.1	AK 103
	DRO	UJ	0.424	1.5	AK 102
	GRO	0.102	0.0500	1.3	AK 101
	PCE	**0.115**	0.00400	0.005	8260B
	VOCs (all others)	ND	Varies	Varies	8260B
MW-3	RRO	ND	0.417	1.1	AK 103
	DRO	UJ	0.417	1.5	AK 102
	GRO	0.0716	0.0500	1.3	AK 101
	PCE	**0.338**	0.0200	0.005	8260B
	VOCs (all others)	ND	Varies	Varies	8260B
MW-4	RRO	UJ	0.403	1.1	AK 103
	DRO	UJ	0.403	1.5	AK 102
	GRO	ND	0.0500	1.3	AK 101
	PCE	**0.0252**	0.00100	0.005	8260B
	VOCs (all others)	ND	Varies	Varies	8260B
MW-5	RRO	0.488	0.417	1.1	AK 103
	DRO	UJ	0.417	1.5	AK 102
	GRO	0.202	0.0500	1.3	AK 101
	PCE	**0.523**	0.0100	0.005	8260B
	VOCs (all others)	ND	Varies	Varies	8260B
MW-6	RRO	UJ	0.400	1.1	AK103
	DRO	UJ	0.400	1.5	AK 102
	GRO	0.384	0.0500	1.3	AK 101
	TCE	0.00137	0.00100	0.005	8260B
	PCE	**0.822**	0.0100	0.005	8260B
	VOCs (all others)	ND	Varies	Varies	8260B
MW-7	RRO	UJ	0.410	1.1	AK103
	DRO	UJ	0.410	1.5	AK 102
	GRO	ND	0.0500	1.3	AK 101
	PCE	**0.00510**	0.00100	0.005	8260B
	VOCs (all others)	ND	Varies	Varies	8260B

[1] = Groundwater cleanup criteria based on 18AAC 75.345 Table C, Method 2

mg/L = milligrams per liter; MRL = method reporting limit; ND = non-detectable, below the MRL; UJ = results estimated below the MRL

DRO = diesel range organics; GRO = gasoline range organics; RRO = residual range organics

VOCs = volatile organic compounds; **BOLD** = Exceeds Alaska Department of Environmental Conservation Cleanup Criteria.

TABLE 4
Fourth Avenue and Gambell Street
ANALYTICAL RESULTS - ADDITIONAL PARAMETERS

Soil Sample No. / Sample Depth (feet bg)	Parameter	Results (mg/Kg)	MRL or PQL (mg/Kg)	Analytical Method
A1/0-2 0 - 2 feet bg	Total Organic Carbon	11,900	536	TOC SGS SOP
C2/2-6 2 - 6 feet bg	Total Organic Carbon	2,520	534	TOC SGS SOP
D3/6-10 6 - 10 feet bg	Total Organic Carbon	2,330	551	TOC SGS SOP
E4/10-14 10 - 14 feet bg	Total Organic Carbon	9,960	557	TOC SGS SOP
F3/6-10 6 -10 feet bg	Total Organic Carbon	9,940	528	TOC SGS SOP
MW-5-30/32 30 - 32 feet bg	Total Organic Carbon	ND	1,000	SW846 9060M
MW-6-22.5/24.5 22.5 - 24.5 feet bg	Total Organic Carbon	ND	1,000	SW846 9060M
MW-7-32.5/34.5 32.5 - 34.5 feet bg	Total Organic Carbon	519,000	1,000	SW846 9060M

Notes:
Samples A1/0-2, C2/2-6, D3/6-10, E4/10-14, F3/6-10 analyzed by SGS Environmental Services
Samples MW-5-30/32, MW6-22.5/24.5, and MW-7-32.5/34.5 analyzed by TestAmerica
bg = below grade; mg/K = milligrams per kilogram; MRL = method reporting limit; PQL = practical quantitation limit

Parameter	MW-3 Results (mg/L)	MW-5 Results (mg/L)	MRL (mg/L)	MCL (mg/L)[1]	Analytical Method
Methane	ND	ND	0.00120		RSK 175
Ethane	ND	ND	0.0100		RSK 175
Ethene	ND	ND	0.0100		RSK 175
Nitrate/Nitrite-Nitrogen	7.62	6.68	0.500	10	EPA 353.2
Sulfides, Dissolved	ND	ND	0.200		EPA 376.2
Sulfate	30.7	36.9	1.00	250	EPA 300.0
Iron	62.0	136	0.150	0.3	EPA 6000/7000
Magnesium	47.7	74.9	0.500		EPA 6000/7000
Acetic Acid	1.0	1.0			VFA
Butyric Acid	1.0	1.0			VFA
Formic Acid	1.0	1.0			VFA
Lactic Acid	1.0	1.0			VFA
Propionic Acid	1.0	1.0			VFA
Pyruvic Acid	1.0	1.0			VFA
Carbon Dioxide	24	36	0.17		RSK SOP-175

Notes:
[1] = Results are compared to the drinking water maximum contaminant levels (MCLs), listed in 18 AAC 80, for these compounds.
mg/L = milligrams per liter; VFA = volatile fatty acids

TABLE 5 **BGES, INC.**

Fourth Avenue and Gambell Street

GROUNDWATER MONITORING WELL SAMPLING LOG

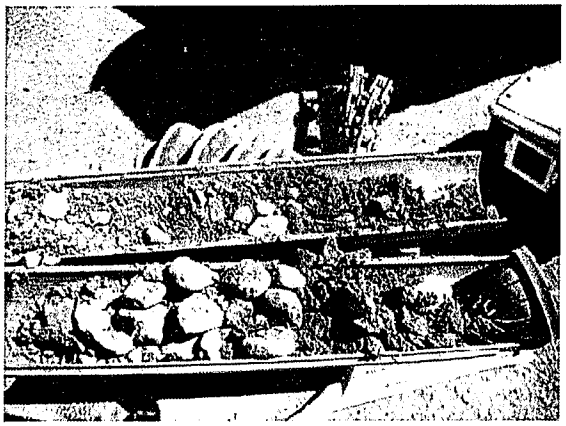
Well Number	MW-1	MW-02	MW-03	MW-4
Date Sampled	08/22/07	08/22/07	8/21/07 & 8/27/07	08/22/07
Date of Depth and Elevation Measurement	08/01/07	08/01/07	08/01/07	08/01/07
Time of Depth to Water Measurement	12:20	12:26	12:46	12:11
Time Sample Collected	8:00	8:40	14:50 / 11:21	9:23
Top of Casing Elevation (feet)	100.53	99.41	100.80	99.77
Depth to Water (feet below top of casing)	39.97	38.72	40.72	38.94
Water Elevation (feet)	60.56	60.69	60.08	60.83
Total Depth of Well (feet below top of casing)	44.06	41.75	44.05	44.16
Ground Elevation	100.21	99.22	100.51	99.28
Depth to Water (feet below top of ground surface)	60.24	60.50	59.79	60.34
Well Casing Diameter (Inches)	2	2	2	2
Standing Water Well Volume (gallons)	0.667	0.494	0.543	0.852
Purge Volume-Actual (gallons)	3.0	3.0	2.5	3.0
Temperature (degrees Celsius)	9.31 / 8.49 / 8.79	8.68 / 8.89 / 8.87	10.64 / 10.95	9.23 / 8.59 / 8.90
pH (standard units)	7.83 / 7.45 / 7.31	7.42 / 7.31 / 7.36	8.92 / 8.37	7.31 / 7.01 / 7.05
Conductivity (microsiemans per centimeter)	0.90 / 0.90 / 0.0	0.90 / 0.90 / 0.90	0.93 / 0.90	0.90 / 0.90 / 0.90
Turbidity (Nephelometric Turbidity Units)	742 / -5.0 / -5.0	-5.0 / -5.0 / -5.0	-5.0 / -5.0	-5.0 / -5.0 / -5.0
Dissolved Oxygen (grams per liter)	9.26 / 9.30 / 8.36	8.93 / 9.01 / 9.80	10.82 / 11.16	9.29 / 9.15 / 9.59
Salinity (percent)	0.0 / 0.0 / 0.0	0.0 / 0.0 / 0.0	0.0 / 0.0	0.1 / 0.0 / 0.0
Total Dissolved Solids (grams per liter)	1.04 / 1.02 / 0.0	0.4 / 0.4 / 0.4	0.6 / 0.5	1.36 / 1.44 / 1.43
Oxidation-Reduction Potential (millivolts)	211 / 220 / 219	221 / 224 / 224	177 / 148	216 / 222 / 218
Notes: Values separated by / indicate readings for successive well volumes removed Samplers: M. Leirer; N. Braman Samples collected with a 1.75-inch bailer Field Measurements collected with a Horiba U-22				

TABLE 5
Fourth Avenue and Gambell Street
GROUNDWATER MONITORING WELL SAMPLING LOG

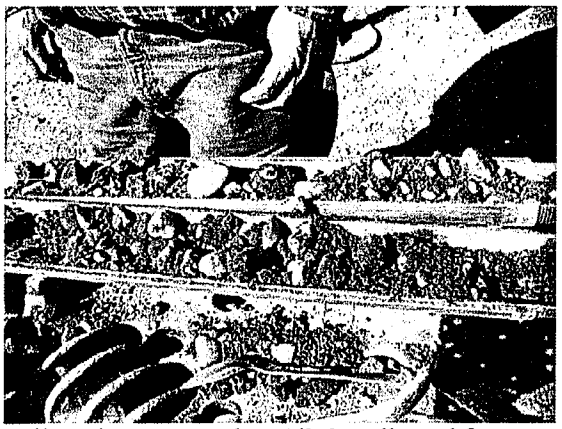
Well Number	MW-5	MW-6	MW-7
Date Sampled	8/21/2007 & 8/27/07	8/22/2007	8/21/2007
Date of Depth and Elevation Measurement	08/01/07	08/01/07	08/01/07
Time of Depth to Water Measurement	12:38	12:29	12:02
Time Sample Collected	16:05 & 11:34	10:12	18:10
Top of Casing Elevation (feet)	103.89	103.45	99.87
Depth to Water (feet below top of casing)	44.71	45.08	38.473
Water Elevation (feet)	59.18	58.37	61.40
Total Depth of Well (feet below top of casing)	49.96	50.00	47.96
Ground Elevation	101.36	101.08	99.58
Depth to Water (feet below top of ground surface)	56.65	56.00	61.11
Well Casing Diameter (Inches)	2	2	2
Standing Water Well Volume (gallons)	0.857	0.803	1.548
Purge Volume-Actual (gallons)	3.0	8.0	7.5
Temperature (degrees Celsius)	10.02 / 10.03 / 9.56	9.11 / 8.68 / 8.76	10.70 / 10.64
pH (standard units)	8.06 / 7.56 / 7.43	7.21 / 7.18 / 7.16	7.65 / 7.55
Conductivity (microsiemans per centimeter)	0.90 / 0.90 / 0.90	0.90 / 0.90 / 0.90	0.90 / 0.90
Turbidity (Nephelometric Turbidity Units)	-5.0 / -5.0 / -5.0	-5.0 / -5.0 / -5.0	-5.0 / -5.0
Dissolved Oxygen (grams per liter)	12.01 / 11.46 / 11.29	10.10 / 9.10 / 9.14	11.23 / 9.34
Salinity (percent)	0.0 / 0.0 / 0.0	0.0 / 0.1 / 0.0	0.0 / 0.0
Total Dissolved Solids (grams per liter)	1.54 / 1.41 / 1.42	1.37 / 1.29 / 1.31	0.5 / 1.49
Oxidation-Reduction Potential (millivolts)	154 / 159 / 171	210 / 204 / 207	196 / 192
Notes: Values separated by / indicate readings for successive well volumes removed Samplers: M. Leirer; N. Braman Samples collected with a 1.75-inch bailer Field Measurements collected with a Horiba U-22		5 gallons removed to develop; 3 gallons purged for sampling	5 gallons removed to develop; 2.5 gallons purged for sampling

APPENDIX A
SITE PHOTOGRAPHS

Soil Boring A in the process of being advanced in the southwest area of the property (facing north).

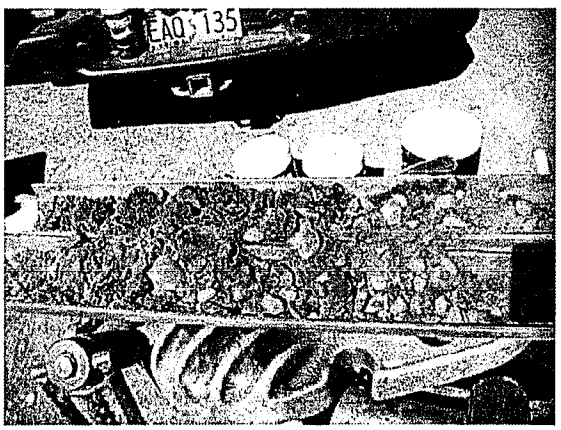


Soil Boring C, sample C1/0-2, collected from a depth of ground surface to 2 feet below grade; duplicate collected from this spoon (G1/0-2).

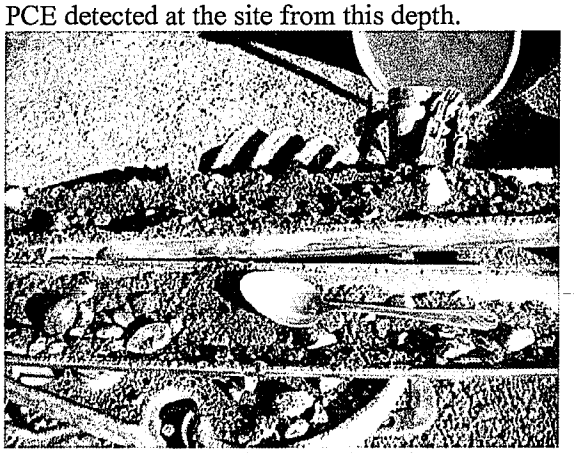


Soil Boring D, sample D1/0-2, collected from a depth of ground surface to 2 feet below grade; PCE and TCE detected in this sample.

Soil Boring D, sample D5/12-14, collected from a depth of 12 to 14 feet below grade; TCE detected, as well as the greatest concentration of PCE detected at the site from this depth.

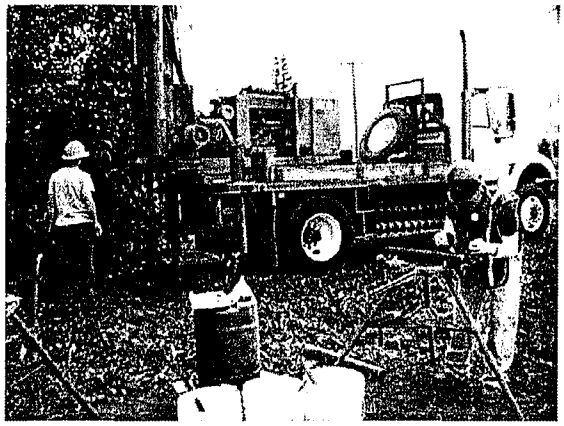


Soil Boring E, sample E1/0-2, collected from a depth of ground surface to 2 feet below grade.

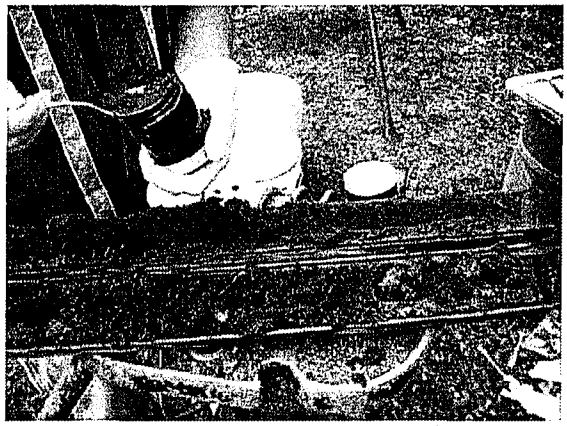


Soil Boring F, screening sample F4/12-14, combined with screening sample F4/10-12; sample submitted as F4/10-12. PCE and TCE were detected in this sample.

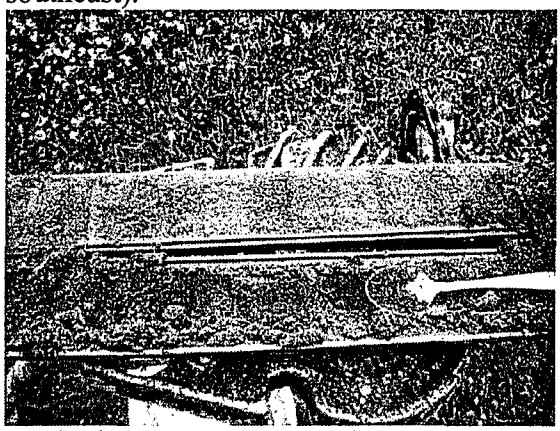
Lots 8A, 10, 11, 12; Block 26A East Addition Fourth Avenue and Gambell Street, Anchorage, Alaska		
BGES, INC.	**December 2007**	**Appendix A**



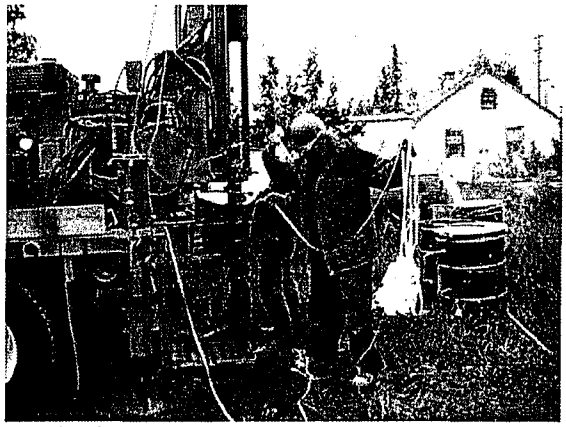
Monitoring Well MW-5 in the process of being advanced in the property north and adjacent to the subject property (facing southeast).



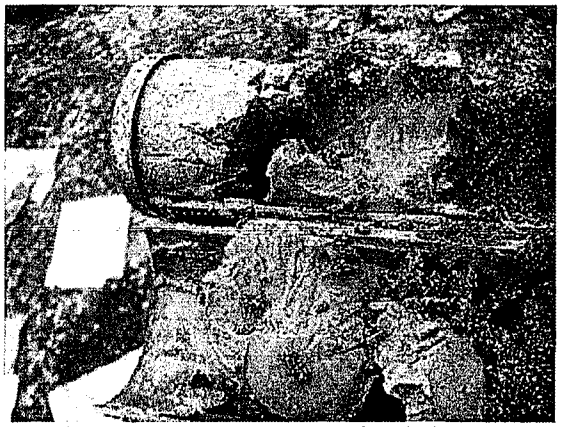
Monitoring Well 5, sample MW-5-40/42, collected from a depth of 40 to 42 feet below grade.



Monitoring Well MW-6, sample MW-6-33/35, collected from a depth of 33 to 35 feet below grade.



Monitoring Well MW-6 in the process of being completed as a well in the property adjacent to the subject property, east of MW-5 (facing east).



Clay layer encountered at 46.7 feet below grade in Monitoring Well MW-7.

Monitoring Well MW-7 in the process of being completed as a well in the southwest corner of the subject property (facing east).

Lots 8A, 10, 11, 12; Block 26A East Addition Fourth Avenue and Gambell Street, Anchorage, Alaska		
BGES, INC.	**December 2007**	**Appendix A**

APPENDIX B
SOIL BORING LOGS

BGES, INC.

BGES, INC.
SOIL BORING LOG

CLIENT: Paul Maney, Fourth Avenue & Gambell Street

BORING NUMBER: A **BORING LOCATION:** Southwest quadrant of property

Date: May 19, 2007 Weather Conditions: Sunny, 47 degrees Fahrenheit, breeze to NE Time: 10:10

PID: Gas Alert Micro 5 Drilling Company/Rig Type: Discovery Drilling/Truck – Mounted

Observer: RML/RNB Drilling/Sampling Method: Hollow-Stem Auger / Split-Spoon

SAMPLE NUMBER	DEPTH (ft) / TIME	PID (ppm) SPOON/SMPL.	DESCRIPTION	BLOW COUNTS
A1/0-2	From: 0 to 2 Time: 10:30	0 / 0	0-7" no recovery; 7-16" silt, trace sand, subangular cobble, light brown to brown. 16" recovery.	N/A
	From: 2 to 5 Time: 11:05	0 / 0	0-20" silt, trace sand; subangular cobble; brown. 20" recovery. Halted using direct-push technology.	N/A
	From: 5 to 7 Time: 12:06	0 / 2	0-3" silt, brown, trace subrounded gravel; 3-19" fine-grained to medium-grained sand, some subrounded gravel; brown. 19" recovery.	11-10-11-12
	From: 7 to 9 Time: 12:18	0 / 1	0-17" coarse-grained sand, subrounded gravel, moist. 17" recovery.	6-11-12-13
A4/9-13	From: 9 to 11 Time: 12:26	0 / 4	0-20" very fine to fine-grained sand, slightly silty, some gravel subrounded to round, moist; black organic lens at 4". 20" recovery.	6-17-20-16
A4/9-13	From: 11 to 13 Time: 12:39	0 / 1	0-18" medium-grained to coarse grained sand; brown; subangular gravel. Silt and gravel at 0-2" and 12-16"; sand at 0-2" is fine-grained. 18" recovery.	10-16-15-11
	From: 13 to 15 Time: 12:54	0 / 1	0-16" very fine to fine-grained sand; subrounded gravel; silty; brown to light brown. 16" recovery.	9-13-17-19

Notes: Attempted utilizing the direct-push technology to collect soils from depths of 0 to 5 feet below grade. The spoon was plastic and 1 ¾" diameter. No blow counts were recorded. The hollow stem auger and split spoon sampling commenced after 5 feet below grade. Soil samples were collected for analysis by combining soils from two subsequent split spoons. Soil Boring A was advanced in southwest corner of subject property. Samples were analyzed for GRO, DRO/RRO, RCRA Metals, and VOCs. Sample A1/0-2 was additionally analyzed for total organic carbons. Soil cuttings and wash water were placed into drums onsite.

BGES, INC.
SOIL BORING LOG

CLIENT: Paul Maney, Fourth Avenue & Gambell Street

BORING NUMBER: C **BORING LOCATION:** East of Soil Boring A

Date: May 19, 2007 Weather Conditions: Sunny, 47 degrees Fahrenheit, breeze to NE Time: 13:10

PID: Gas Alert Micro 5 Drilling Company/Rig Type: Discovery Drilling/Truck – Mounted

Observer: RML Drilling/Sampling Method: Hollow-Stem Auger / Split-Spoon

SAMPLE NUMBER	DEPTH (ft) / TIME	PID (ppm) SPOON/SMPL.	DESCRIPTION	BLOW COUNTS
C1/0-2	From: 0 to 2 Time: 10:30	0 / 2	0-10" silt; trace sand; subrounded to subangular gravel; 10" clay, orange-brown lens; 11-14" fine-grained sand; gray. 14" recovery.	7-7-3-4
C2/2-6	From: 2 to 4 Time: 13:29	0 / 0	0-12" medium-grained sand, brown, rounded to subrounded gravel. 12-23" silt, trace sand, rounded to surbrounded gravel. 23" recovery.	16-23-26-24
C2/2-6	From: 4 to 6 Time: 13:38	0 / 0	0-12" fine-grained sand, brown, subrounded gravel. 12-22" medium grained sand, brown, subrounded gravel; 22-24" coarse-grained sand, few cobble.	14-14-12-13
C3/6-10*	From: 6 to 8 Time: 13:51	0 / 2	0-19" medium-grained sand, trace silt, brown, subangular to subrounded gravel. 19" recovery.	12-15-15-20
C3/6-10*	From: 8 to 10 Time: 14:07	0 / 12	0-18" medium-grained sand, brown, subrounded gravel; black organic lens at 12". 18" recovery.	14-14-16-15
	From: 10 to 12 Time: 14:42	0 / 0	0-17" medium grained sand, trace silt, brown, subrounded gravel. 17" recovery.	15-12-14-13
	From: 12 to 14 Time: 14:50	0 / 1	0-19" coarse-grained sand, trace silt, brown, subrounded gravel. 19" recovery.	8-11-14-18

Notes: Soil samples were collected for analysis by combining soils from two subsequent split spoons, except for depths 0 to 2 feet below grade. Soil Boring C was advanced in east of Soil Boring A. Samples were analyzed for GRO, DRO/RRO, RCRA Metals, and VOCs. Soil cuttings and wash water were placed into drums onsite. *Duplicate sample of C3/6-10 collected and submitted blindly to the laboratory as G3/6-10. Sample C2/2-6 was analyzed only for total organic carbons.

BGES, INC.

BGES, INC.
SOIL BORING LOG

CLIENT: Paul Maney, Fourth Avenue & Gambell Street

BORING NUMBER: D **BORING LOCATION:** North of Soil Boring C

Date: May 19, 2007 Weather Conditions: Sunny, 47 degrees Fahrenheit, wind to NE Time: 16:43

PID: Gas Alert Micro 5 Drilling Company/Rig Type: Discovery Drilling/Truck – Mounted

Observer: RML Drilling/Sampling Method: Hollow-Stem Auger / Split-Spoon

SAMPLE NUMBER	DEPTH (ft) / TIME	PID (ppm) SPOON/SMPL.	DESCRIPTION	BLOW COUNTS
D1/0-2	From: 0 to 2 Time: 16:46	0 / 12	0-11" silt, brown, subangular gravel; 11-24" silt, trace sand, subangular gravel, brown. 24" recovery.	4-6-7-5
	From: 2 to 4 Time: 16:57	0 / 18	0-17" silt, trace sand, few rounded gravel; 17-18" tightly packed silt, brown. 18" recovery.	4-3-3-3
	From: 4 to 6 Time: 17:05	0 / 12	0-7" tightly packed silt, brown; 7-14" silt, trace sand; 14-16" tightly packed silt, trace sand; brown; subangular gravel. 16" recovery.	8-4-2-4
D3/6-10	From: 6 to 8 Time: 17:12	0 / 1	0-5" silt, brown, rounded to subrounded gravel; 5-6" clay, brown; 6-11" silt, trace sand; 11-17" coarse grained sand, subrounded gravel; brown/gray. 17" recovery.	4-4-5-6
D3/6-10	From: 8 to 10 Time: 17:20	0 / 3	0-19" fine-grained sand, coarser sand towards 19" with trace silt; brown; angular gravel. 19" recovery.	6-10-12-12
	From: 10 to 12 Time: 17:30	0 / 2	0-19" medium grained sand, trace silt, subangular gravel. 19" recovery.	8-11-15-17
D5/12-14	From: 12 to 14 Time: 17:42	16 / 46	0-4" (16 ppm) silt, trace sand, brown and black; 4" black organic lens; 4-22" silt, trace sand; 22-24" black organic lens.. 24" recovery.	7-10-10-10

Notes: Soil samples were collected for analysis by combining soils from two subsequent split spoons, except for depths 0 to 2 feet below grade, and 12 to 14 feet below grade. Soil Boring D was advanced north of Soil Boring C. Samples were analyzed for GRO, DRO/RRO, RCRA Metals, and VOCs. Soil cuttings and wash water were placed into drums onsite. Sample D3/6-10 analyzed only for total organic carbons.

BGES, INC.
SOIL BORING LOG

CLIENT: Paul Maney, Fourth Avenue & Gambell Street

BORING NUMBER: E BORING LOCATION: East of Soil Boring C

Date: May 19, 2007 Weather Conditions: Sunny, 47 degrees Fahrenheit, wind to NE Time: 15:09

PID: Gas Alert Micro 5 Drilling Company/Rig Type: Discovery Drilling/Truck – Mounted

Observer: RML Drilling/Sampling Method: Hollow-Stem Auger / Split-Spoon

SAMPLE NUMBER	DEPTH (ft) / TIME	PID (ppm) SPOON/SMPL.	DESCRIPTION	BLOW COUNTS
E1/0-2	From: 0 to 2 Time: 15:10	0 / 1	0-5" silt, trace sand, gray, small rounded cobbles; at 4" darker gray; 5-10" silt, trace sand, brown, sub-rounded cobbles; 10-16" clay, reddish-brown; 16-18" silty clay, lighter brown. 18" recovery.	7-3-3-5
E2/2-6	From: 2 to 4 Time: 15:27	0 / 0	0-19" fine-grained sand, brown, sub-rounded gravel. 19" recovery.	9-9-9-12
E2/2-6	From: 4 to 6 Time: 15:35	0 / 0	0-18" coarse-grained sand, brown, sub-rounded gravel. 18" recovery.	10-13-12-9
	From: 6 to 8 Time: 15:49	0 / 0	0-19" coarse-grained sand, brown, sub-rounded gravel. 19" recovery.	11-15-17-19
	From: 8 to 10 Time: 16:00	0 / 0	0-12" coarse-grained sand; 12-16" medium-grained sand, trace silt, brown, rounded gravel. 16" recovery.	15-19-18-18
E4/10-14	From: 10 to 12 Time: 16:09	0 / 0	0-8" coarse-grained sand, brown, subangular gravel; 8-19" coarse grained sand, trace silt, subrounded gravel. 19" recovery.	15-19-18-18
E4/10-14	From: 12 to 14 Time: 16:18	0 / 1	0-16" medium-grained sand, trace silt, subrounded gravel; 16" black organic layer; 16-19" coarse-grained sand. 19" recovery.	10-9-10-9

Notes: Soil samples were collected for analysis by combining soils from two subsequent split spoons, except for depths 0 to 2 feet below grade, and 12 to 14 feet below grade. Soil Boring E was advanced north of Soil Boring C and south of Soil Boring F. Samples were analyzed for GRO, DRO/RRO, RCRA Metals, and VOCs. Soil cuttings and wash water were placed into drums onsite. Sample E4/10-14 was analyzed only for total organic carbons.

BGES, INC.

BGES, INC.
SOIL BORING LOG

CLIENT: Paul Maney, Fourth Avenue & Gambell Street

BORING NUMBER: F **BORING LOCATION:** North of Soil Boring E

Date: May 19, 2007 Weather Conditions: Sunny, 47 degrees Fahrenheit, wind to NE Time: 18:10

PID: Gas Alert Micro 5 Drilling Company/Rig Type: Discovery Drilling/Truck – Mounted

Observer: RML Drilling/Sampling Method: Hollow-Stem Auger / Split-Spoon

SAMPLE NUMBER	DEPTH (ft) / TIME	PID (ppm) SPOON/SMPL.	DESCRIPTION	BLOW COUNTS
F1/0-2	From: 0 to 2 Time: 18:12	0 / 4	0-6" fine sand, trace silt, brown, subangular gravel. 6-14" tightly packed silt, trace fine-grained sand, brown. 14" recovery.	10-7-3-4
	From: 2 to 4 Time: 18:24	0 / 2	0-19" fine-grained to medium-grained sand, brown, subangular gravel. 19" recovery.	9-10-13-14
	From: 4 to 6 Time: 18:40	0 / 1	0-10" silt, trace sand, subrounded gravel. 10-19" fine grained sand, trace silt, brown. 19" recovery.	27-11-10-10
F3/6-10	From: 6 to 8 Time: 18:45	0 / 0	0-19" coarse-grained sand, trace silt, brown-gray, subrounded gravel. 19" recovery.	5-7-9-9
F3/6-10	From: 8 to 10 Time: 18:57	0 / 2	0-2" black organic layer, silt, trace sand, brown. 2-19" medium grained sand, brown, rounded to subrounded gravel. 19" recovery.	8-10-12-11
F4/10-14	From: 10 to 12 Time: 19:07	0 / 2	0-19" medium-grained sand, trace silt, subrounded gravel, brown, dry. 19" recovery.	10-14-16-14
F4/10-14	From: 12 to 14 Time: 19:18	0 / 6	0-19" coarse-grained sand, trace silt, subrounded gravel, brown, dry. 19" recovery.	10-11-11-11

Notes: Soil samples were collected for analysis by combining soils from two subsequent split spoons, except for depths 0 to 2 feet below grade. Soil Boring F was advanced north of Soil Boring E Samples were analyzed for GRO, DRO/RRO, RCRA Metals, and VOCs. Soil cuttings and wash water were placed into drums onsite. Sample F3/6-10 was analyzed only for total organic carbons.

BGES, INC.

BGES, INC.
SOIL BORING LOG

CLIENT: Paul Maney, Fourth Avenue & Gambell Street

BORING NUMBER: SB-1 (MW-5) **BORING LOCATION:** Off Site; NE of MW-3

Date: July 23, 2007 Weather Conditions: Cloudy, 58 degrees Fahrenheit Time: 11:15

PID: Gas Alert Micro 5 Drilling Company/Rig Type: Discovery Drilling/Truck – Mounted

Observer: RML/ML Drilling/Sampling Method: Hollow-Stem Auger / Split-Spoon

SAMPLE NUMBER	DEPTH (ft) / TIME	PID (ppm) SPOON/SMPL.	DESCRIPTION	BLOW COUNTS
	From: 5.0 to 7.0 Time: 10:44	0 / 0	0-6" dry organic material. 6-20" medium grained sand; some subangular cobbles; moist. 20" recovery.	8-7-7-7
	From: 7.5 to 9.5 Time: 11:00	0 / 0	1-17" medium grained sand; trace silt; brown; subangular cobbles; moist. 17" recovery.	5-4-4-5
	From: 10 to 12 Time: 11:12	0 / 0	0-6" fine grained sand; trace silt and organic material; subangular cobbles. 6-20" coarse grained sand, brown; trace silt; large subangular cobbles. 20" recovery.	7-5-5-6
	From: 12.5 to 14.5 Time: 11:24	0 / 0	0-6" fine grained sand; trace silt; subangular cobbles. 6-21" fine grained to medium grained sand; brown; subangular cobbles. 21" recovery.	5-4-5-5
MW-5-15/17	From: 15 to 17 Time: 11:36	0 / 2	0-20" medium grained to coarse grained sand; brown; large subangular cobbles. 20" recovery.	6-6-8-9
	From: 17.5 to 19.5 Time: 11:45	5 / 2	0-6" fine grained to medium grained silty sand; some clay veins; subangular cobbles. 6-9" medium grained sand, trace silt; black organic layer. 9-19" medium grained to coarse grained sand, subangular cobbles. 19-23" medium grained sand; small subangular cobbles. 23" recovery.	7-7-9-6
	From: 20 to 22 Time: 12:01	0 / 0	0-18" medium grained sand, trace silt, brown; some subangular cobbles. 18" recovery.	9-6-12-13
	From: 22.5 to 24.5 Time: 12:17	0 / 0	0-6" medium grained sand, trace silt, brown; subangular cobbles. 6-21" medium grained silty sand with black organic material; subangular cobbles. 18" recovery.	10-11-13-17

BGES, INC.

BGES, INC.
SOIL BORING LOG

(Continued)

BORING NUMBER: SB-1 (MW-5)

SAMPLE NUMBER	DEPTH (ft) / TIME	PID (ppm) SPOON/SMPL.	DESCRIPTION	BLOW COUNTS
MW-5-25/27	From: 25 to 27 Time: 12:29	2 / 2	0-14" medium grained sand; trace silt; moist; subangular cobbles; 14-18" medium grained sand, trace silt; subangular cobbles. 18" recovery.	8-14-15-16
	From: 27.5 to 29.5 Time: 13:02	5 / 0	0-6" fine grain to medium grain sand; trace silt; dark brown; large subangular cobbles; 6-24" fine grained to medium grained sand, brown.7" slough; 24" recovery.	11-16-15-14
MW-5-30/32	From: 30 to 32 Time: 13:11	0 / 0	0-20" fine grained to medium grained sand, trace silt; small subangular cobbles. 20" recovery.	10-13-16-24
	From: 32.5 to 34.5 Time: 13:22	0 / 0	0-17" fine grained sand, trace silt. 17" recovery.	11-15-11-11
	From: 35 to 37 Time: 13:35	12 / 0	0-4" fine grained silty sand; brown. 4-9" coarse grained sand, brown; some subangular cobbles. 9-24" fine grained sand; brown; no cobbles. 24" recovery.	11-13-14-18
	From: 37.5 to 39.5 Time: 13:46	5 / 2	0-17" fine grained sand. 17-24" medium grained sand. 24" recovery.	9-12-12-11
MW-5-40/42	From: 40 to 42 Time: 13:57	14 / 6	0-6" fine grained silty sand, brown. 6-18" fine grained to medium grained sand, brown. 18-24" coarse grained sand, brown, wet. 24" recovery.	8-8-9-12
	From: 42.5 to 44.5 Time: 14:05	0 / 0	0-6" medium grained to coarse grained silty sand, moist. 6-22" fine grained to medium grained sand, moist. 22" recovery.	8-10-12-13
	From: 45 to 47 Time: 14:13	0 / 0	0-20" fine grained to medium grained sand, trace silt, moist. 20-24" clay.	Not Recorded

Notes: Soil boring installed in adjacent property located to the north of the subject property, towards the western portion of the lot. This soil boring (SB-1) was completed as Monitoring Well 5 (MW-5). MW-5-30/32 soil sample analyzed for TOC only. All other analytical samples were analyzed for DRO/RRO, RCRA Metals, VOCs, and GRO.

BGES, INC.

BGES, INC.
SOIL BORING LOG

CLIENT: Paul Maney, Fourth Avenue & Gambell Street

BORING NUMBER: SB-2 (MW-6) **BORING LOCATION:** Off Site; E of MW-5

Date: July 25, 2007 Weather Conditions: Cloudy, 60 degrees Fahrenheit Time: 09:00

PID: Gas Alert Micro 5 Drilling Company/Rig Type: Discovery Drilling/Truck – Mounted

Observer: RML/RJ Drilling/Sampling Method: Hollow-Stem Auger / Split-Spoon

SAMPLE NUMBER	DEPTH (ft) / TIME	PID (ppm) SPOON/SMPL.	DESCRIPTION	BLOW COUNTS
	From: 0 to 2 Time: 09:22	0 / 0	0-4" dry organic material, subangular cobbles; 4-9" fine grained sand, subangular cobbles; 9-13" fine grained sand, trace silt; 13-17 fine grained sand, subangular cobbles. 17" recovery.	2-2-4-8
	From: 5 to 7 Time: 09:35	0 / 0	0-6" fine grained sand; trace silt; large subangular cobbles. 6-19" medium to coarse grained sand, trace silt, large subangular cobbles. 19" recovery.	10-9-10-14
MW-6-10/12	From: 10 to 12 Time: 09:52	0 / 2	0-17" medium grained sand; large rounded cobbles/some small subangular cobbles; black organic layer at 12". 17" recovery.	5-9-11-12
	From: 15 to 17 Time: 10:07	0 / 2	0-3" organic materials, slightly silty. 3-19" medium grained sand, trace silt, small subangular cobbles and larger rounded cobbles. 19" recovery.	9-11-11-16
MW-6-20/22	From: 20 to 22 Time: 10:25	2 / 2	0-21" medium grained sand, trace silt; subangular to subrounded cobbles. 21" recovery.	10-13-15-17
MW-6-22.5/22.4	From: 22.5 to 24.5 Time: 10:40	0 / 0	0-18" medium grained sand, trace silt; small subangular cobbles and larger rounded cobbles. 18" recovery.	8-10-15-16
	From: 27.5 to 29.5 Time: 11:00	0 / 2	0-18" medium grained sand, trace silt, brown; small subangular and rounded cobbles. 18" recovery.	8-11-9-9
	From: 30.5 to 32.5 Time: 11:25	4 / 0	0-7" fine grained to medium grained silty sand; gray/brown; small subangular cobbles. 7-20" fine grained to medium grained sand; trace silt. 19-20" layer of silt and black organic material. 20" recovery.	6-8-9-10

BGES, INC.

BGES, INC.
SOIL BORING LOG

(Continued)

BORING NUMBER: SB-2 (MW-6)

SAMPLE NUMBER	DEPTH (ft) / TIME	PID (ppm) SPOON/SMPL.	DESCRIPTION	BLOW COUNTS
MW-6-33/35	From: 33 to 35 Time: 11:47	6 / 0	0-19" fine grained to medium grained sand; brown; no cobbles. 19-24" silt, trace fine grained sand; gray/brown/black. 24" recovery.	8-10-11-14
	From: 35.5 to 37.5 Time: 12:00	4 / 0	0-24" fine grained to medium grained silty sand; no cobbles. 24" recovery.	8-10-11-11
	From: 40 to 42 Time: 12:12	0 / 0	0-13" fine grained sand, trace silt, brown. Rusty veins at 6". 13-18" coarse grained sand, trace silt; wet. 18" recovery.	10-10-12-15
	From: 42.5 to 44.5 Time: 12:30	0 / 0	0-20" medium grained sand; brown; wet. 20" recovery.	10-9-11-13
	From: 45 to 47 Time: 12:45	0 / 0	0-21" medium grained sand; wet. Clay layer at 12.5". 21-24" clay, gray. 24" recovery.	10-12-9-11

Notes: Soil boring installed in adjacent property located to the north of the subject property, towards the eastern portion of the lot. This soil boring (SB-2) was completed as Monitoring Well 6 (MW-6). MW-6-22.5/24.5 soil sample was analyzed for TOC only. All other analytical samples were analyzed for DRO/RRO, RCRA Metals, VOCs, and GRO.

BGES, INC.

BGES, INC.
SOIL BORING LOG

CLIENT: Paul Maney, Fourth Avenue & Gambell Street

BORING NUMBER: SB-3 (MW-7) **BORING LOCATION:** Southwest corner of subject property

Date: July 25, 2007 Weather Conditions: Cloudy, 60 degrees Fahrenheit Time: 09:00

PID: Gas Alert Micro 5 Drilling Company/Rig Type: Discovery Drilling/Truck – Mounted

Observer: RML Drilling/Sampling Method: Hollow-Stem Auger / Split-Spoon

SAMPLE NUMBER	DEPTH (ft) / TIME	PID (ppm) SPOON/SMPL.	DESCRIPTION	BLOW COUNTS
	From: 0 to 2 Time: 09:10	0 / 0	0-6" coarse grained sand; brown; large rounded cobbles. 6-15" silt, brown, trace fine grained sand. 15-18" fine grained sand, trace silt; small subangular cobbles. 18" recovery.	4-3-9-12
	From: 5 to 7 Time: 09:17	0 / 0	0-12" medium grained silty sand; subangular cobbles; moist. 12-18" silt, trace fine grained sand; subangular cobbles; dry. 18" recovery.	8-7-10-9
	From: 10 to 12 Time:	0 / 0	0-12" medium grained sand; brown; subangular cobbles. 12-14" silty sand, moist; rounded cobbles; cobbles are black. 14-19" fine grained silty sand; rounded to subangular cobbles. 19" recovery.	8-8-13-15
MW-7-15/17	From: 15 to 17 Time:	0 / 0	0-5" fine grained silty sand; rounded and subangular cobbles. 5-9" fine grained sand; brown. 9-18" medium grained sand, trace silt; subangular cobbles; black organic layer from 15-15.5". 18-24" slough. 24" recovery.	9-10-10-12
	From: 20 to 22 Time:	0 / 0	0-7" fine grained silty sand; rounded and subangular cobbles. 7-19" medium grained silty sand, brown; subangular cobbles. 19-24" slough. 24" recovery.	11-13-16-19
MW-7-25/27	From: 25 to 27 Time: 10:07	0 / 0	0-0.5" black organic material. 0.5-17" fine grained silty sand; moist. 17-24" medium grained sand, trace silt; small subangular cobbles. 24" recovery.	9-9-12-14
	From: 30 to 32 Time: 10:34	0 / 0	0-19" medium grained sand, trace silt; small subangular cobbles. Larger subangular cobbles from 12-19". 19" recovery.	10-11-13-15
	From: 32.5 to 34.5 Time: 10:47	0 / 0	0-20" fine grained to medium grained sand, trace silt. 20-24" slough. 24" recovery.	8-12-14-12

BGES, INC.

BGES, INC.
SOIL BORING LOG

(Continued)

BORING NUMBER: SB-3 (MW-7)

SAMPLE NUMBER	DEPTH (ft) / TIME	PID (ppm) SPOON/SMPL.	DESCRIPTION	BLOW COUNTS
MW-7-35/37	From: 35 to 37 Time: 10:56	2 / 0	0-20" fine grained silty sand; at 15-18" striations of rusty colored sand. 20" recovery.	9-12-12-14
	From: 37.5 to 39.5 Time: 11:11	0 / 0	0-20" fine grained sand; moist to wet.	6-10-12-12
	From: 40 to 42 Time: 11:22	0 / 0	0-20" fine grained sand; wet. 8-10" layer of black organic material; 20-24" slough. 20" recovery.	5-8-8-14
	From: 42.5 to 44.5 Time: 11:38	0 / 0	0-24" fine grained sand; wet.	8-11-16-17
	From: 45 to 47 Time: 11:50	0 / 0	0-19" fine grained sand. 19-24" densely pack clay; gray. 24" recovery.	6-5-5-4

Notes: Soil boring installed in the southwest corner of subject property. This soil boring (SB-3) was completed as Monitoring Well 7 (MW-7). MW-7-32.5/34.5 soil sample was analyzed for TOC only. All other analytical samples were analyzed for DRO/RRO, RCRA Metals, VOCs, and GRO. Water was encountered at 39.5 feet bg.

APPENDIX C
MONITORING WELLS CONSTRUCTION DIAGRAMS

BGES, INC.
WELL COMPLETION LOG

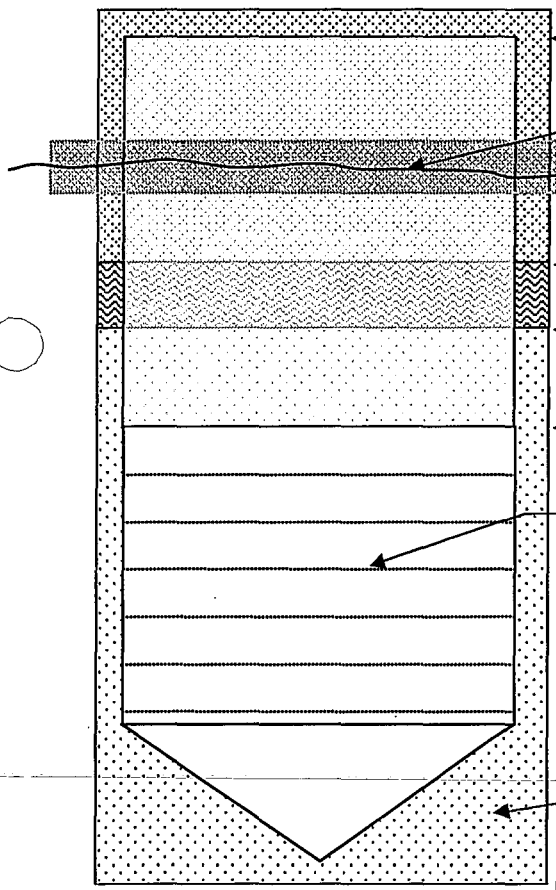
WELL NUMBER: MW-5

Date: July 23, 2007 Weather Conditions: Cloudy, 58 degrees Fahrenheit

Time: 14:30 Drilling Company/Rig: Discovery Drilling/Truck – Mounted

Type: 20-Slot 2-inch well screens

Observer: R. LaFata Drilling/Sampling Method: Hollow-Stem Auger / Split-Spoon



2.96 Top of Casing (Feet Above Grade)

2.3 Top of Sand Pack (Feet Above Grade)

Grade

Cement Seal

5 Bentonite (Feet Below Grade)

31.5 Top of Sand Pack (Feet Below Grade)

33.5 Top of Screen (Feet Below Grade)

10-feet of 2-inch inside diameter, 20-Slot PVC screen

40 Depth to Water at Time of Drilling (Feet Below Grade)

43.5 Bottom of 20-Slot Screen (Feet Below Grade)

15.5 feet of Colorado Silica Sand

47 Bottom of End Cap

Well Completion – Flush Grade ☐ Stickup ☒

TOC Elevation: 103.89 Total Well Depth (Ft. BTOC): 49.96 feet

Notes: Drawing not to scale. TOC = top of casing; BTOC = below top of casing. The well was constructed using a 10-foot length of 2-inch PVC well screen. Cement was placed at the top of the grade around the well casing. Bottom of screen begins at 43.5 feet bg.

BGES, INC.
WELL COMPLETION LOG

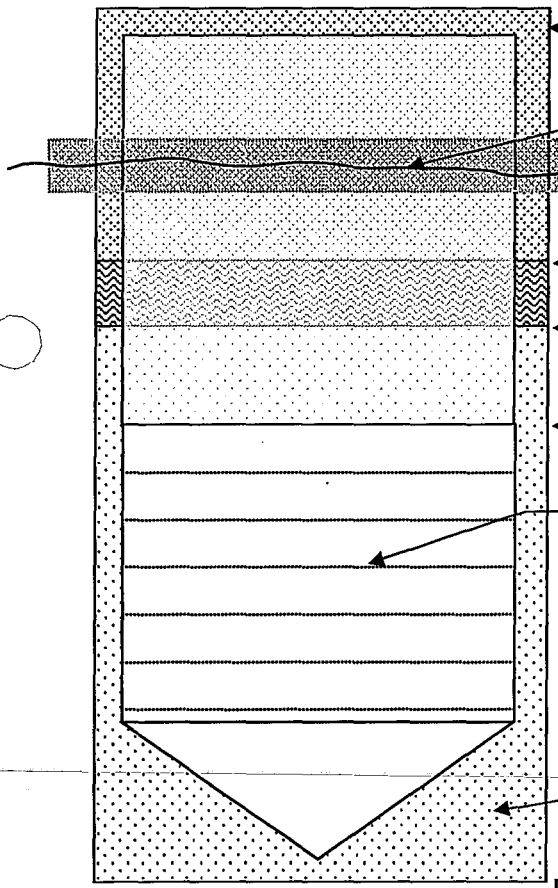
WELL NUMBER: MW-6

Date: July 24, 2007 Weather Conditions: Rainy, 50 degrees Fahrenheit

Time: 13:05 Drilling Company/Rig: Discovery Drilling/Truck – Mounted

Type: 20-Slot 2-inch well screens

Observer: R. LaFata Drilling/Sampling Method: Hollow-Stem Auger / Split-Spoon



2.5 Top of Casing (Feet Above Grade)

1.7 Top of Sand Pack (Feet Above Grade)

Grade

Cement Seal

4.5 Bentonite (Feet Below Grade)

32 Top of Sand Pack (Feet Below Grade)

34 Top of Screen (Feet Below Grade)

10-feet of 2-inch inside diameter, 20-Slot PVC screen

40 Depth to Water at Time of Drilling (Feet Below Grade)

44 Bottom of 20-Slot Screen (Feet Below Grade)

15.5 feet of Colorado Silica Sand

47.5 Bottom of End Cap

Well Completion – Flush Grade ☐ Stickup ☒

TOC Elevation: 103.45 Total Well Depth (Ft. BTOC): 50 feet

Notes: Drawing not to scale. TOC = top of casing; BTOC = below top of casing. The well was constructed using a 10-foot length of 2-inch PVC well screen. Cement was placed at the top of the grade around the well casing. Bottom of screen begins at 44 feet bg.

BGES, INC.
WELL COMPLETION LOG

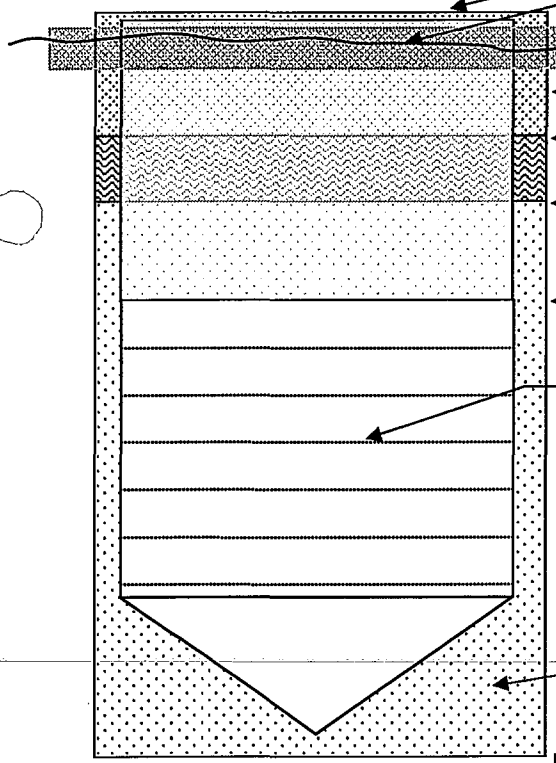
WELL NUMBER: MW-7

Date: July 25, 2007 Weather Conditions: Cloudy, light rain, 60 degrees Fahrenheit

Time: 12:15 Drilling Company/Rig: Discovery Drilling/Truck – Mounted

Type: 10-Slot 2-inch well screens

Observer: R. LaFata Drilling/Sampling Method: Hollow-Stem Auger / Split-Spoon



0.46 Top of Casing (Feet Above Grade)

Grade

Cement Seal

0.3 Top of Sand Pack (Feet Below Grade)

3.3 Bentonite (Feet Below Grade)

32 Top of Sand Pack (Feet Below Grade)

34 Top of Screen (Feet Below Grade)

10-feet of 2-inch inside diameter, 10-Slot PVC screen

39.5 Depth to Water at Time of Drilling (Feet Below Grade)

44 Bottom of 20-Slot Screen (Feet Below Grade)

15.5 feet of Colorado Silica Sand

47.5 Bottom of End Cap

Well Completion – Flush Grade ☒ Stickup ☐

TOC Elevation: 99.87 Total Well Depth (Ft. BTOC): 47.96 feet

Notes: Drawing not to scale. TOC = top of casing; BTOC = below top of casing. The well was constructed using a 10-foot length of 2-inch PVC well screen. Cement was placed at the top of the grade around the well casing. Bottom of screen begins at 44 feet bg.